

BRITISH HERBAL PHARMACOPOEIA

1983

This unified volume brings together the two hundred and thirty-three monographs previously published in three volumes as The British Herbal Pharmacopoeia Parts I, II & III.

The presentation of the monographs gives clear and adequate details of the plant material making the Pharmacopoeia an essential tool for the Scientist, Industrialist, Practitioner and User in Herbal Therapy.

The Macroscopical and Microscopical descriptions are unique in their clarity and accuracy.

Standards of Purity have been included and emendations and additions made.

The comprehensive therapeutic index is invaluable for Practitioner and User alike, particularly as specific indications are given, making The British Herbal Pharmacopoeia a comprehensive reference book.

£35.00

**BRITISH HERBAL
PHARMACOPOEIA**

1983

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BRITISH HERBAL PHARMACOPOEIA

1983

Published by the

BRITISH HERBAL MEDICINE ASSOCIATION

and produced by the Association's

SCIENTIFIC COMMITTEE

PREFACE

This consolidated Edition brings together the monographs previously published in Parts 1, 2 and 3, to present the British Herbal Pharmacopoeia in one complete volume..

No attempt has been made to revise the original material and those alterations which appear have been made in the interests of accuracy and consistency. To produce a uniform format minor changes in descriptions have taken place. Additional standards have been introduced to a limited extent and certain modifications made to the therapeutics.

The present membership of the Committee is as follows: –

Dr. F. J. Evans, B.Pharm., Ph.D., M.P.S., F.L.S.

Mr. H. Hall, M.P.S. (Secretary)

Dr. B. Howarth, M.B., Ch.B., M.N.I.M.H.

Mr. F. Fletcher Hyde, B.Sc., F.N.I.M.H.

Dr. Betty P. Jackson, B.Pharm., B.Sc., Ph.D., F.P.S., F.L.S.

Mr. H. W. Mitchell (Chairman)

Mrs. M. B. Robinson, B.Sc., F.P.S., M.R.I.C.

Mr. J. R. Ward

Dr. Elizabeth Williamson, B.Sc., Ph.D., M.Sc.

In acknowledging the expertise readily given by the present and former members of the Committee special appreciation is made of the services rendered by the retired Chairman, Mr. F. Fletcher Hyde. Without his vision and dedication this work would not have been attempted or completed. Since its inception the Committee has been fortunate to have the services of Mr. H. Hall as Secretary who has not only dealt with the manifold tasks of supporting the Committee but also contributed much from his vast and unparalleled knowledge of the herbal industry.

The increased interest in natural raw materials as evidenced by the inclusion of some 35 monographs of natural substances in the 1980 BP underlines the need to engage in continual research. In this context the Committee has decided to embark on a total revision of the British Herbal Pharmacopoeia over the next few years.

January 1983

H. W. Mitchell
Chairman

Sections 1, 2 and 3 published	1971-4
Part One published	1976
Part Two published	1979
Part One reissued	1980
Consolidated Edition published	1983

General References

MARTINDALE – The Extra Pharmacopoeia.

JACKSON & SNOWDON – Powdered Vegetable Drugs, Atlas of Pharmacognosy, 1968.

Preface to 1974 Edition

In a day when the quality, efficacy and safety of all medicinal substances are under scrutiny and the Medicines Act has been framed to protect the user from the danger of new and insufficiently tested drugs, it has been decided to examine again our herbal materia medica. Since 1965 the Scientific Committee under the aegis of the British Herbal Medicine Association has continuously carried out this work and the following series of monographs constitute a preliminary publication of their findings.

The Committee represents pharmacy, pharmacognosy, science and medicine as well as herbal practice, every member bringing his specialized knowledge and experience to bear on particular aspects of each botanical drug. A large amount of work was involved in the formulation of draft after draft until the final monograph was ready. The statements contained in these pages have been verified wherever possible by observation or the experience of some member of the Committee. The monographs are not a re-writing of previously published material but are based on much original work. In addition to the contributions of the Committee Members, the Chairman was able to draw freely from the observations sent to him by collaborators in the Research Department of the National Institute of Medical Herbalists, and he would like to thank these practitioners for their valuable help. Our work will be further assisted by receiving comments, based upon experience, from readers of these papers. Such comments will be considered when the monographs are revised, and may be sent to the Hon. Secretary, Mr H. Hall or to the Chairman.

In producing the monographs an endeavour has been made to express the facts about each botanical as briefly and succinctly as possible. The general **definition** of the remedy includes, where applicable, a mention of the physiologically active constituents and references to pharmacopoeias which contain supplementary information. Then follows the **pharmacognostical section** which is based on original work and includes

atlas and other references to supplement the description. As the results of chromatographic examination of these herbs become available they will be added and will enable standards of quality to be defined with greater precision. The **therapeutic section** provides an outline of the action of the remedy, the indications and often the specific indication with suggestions for combination with other remedies. The question of untoward effects has been carefully considered in each instance in order to report on the safety of the remedy. If the Committee received evidence of toxicity in therapeutic dosage the fact has been recorded. Documentary references to certain important therapeutic uses have been given in the text or as a footnote.

Under **preparation and dosage** data are given for internal use unless otherwise stated. The word 'alcohol' in each instance refers to ethyl alcohol. The strength of the extracting alcohol given in the monographs becomes reduced in the finished preparation due to dilution by the extractive. Dosage has been given in metric units. It may help to be reminded that, as an approximation.

1 g	=	15 grains
4 g	=	1 drachm
1 ml	=	15 minims
3.5 ml	=	1 fl. drachm
30 ml	=	1 fl. ounce

An infusion is an aqueous preparation applicable to botanical drugs of light structure and without dense tissue whose constituents are soluble in water. An infusion is made by pouring 500 ml (approx. 1 pint) boiling water over 30 g (1 oz) of the finely cut material in a previously warmed vessel and allowing to stand for 15 minutes. This is then strained and taken in divided doses proportionate to the amount of drug prescribed.

A decoction is an aqueous preparation obtained by boiling and then simmering the botanical drug with water. This method is used for hard woody substances whose constituents are water soluble and non-volatile. A decoction is usually made in the ratio of 30 g (1 oz) of the cut or crushed drug simmered in 500 ml (1 pint) of water until the volume is reduced by one quarter. The whole is then cooled and strained and taken in divided doses proportionate to the amount of drug prescribed. Infusions and decoctions are not permanent preparations and should be prepared fresh daily.

The abbreviated references used are as shown in 'The World List of Scientific Periodicals' (1965) 4th edition, Ed. P. Brown and G.B. Stratton, London: Butterworths. The unit of length used in microscopical measurements ' μm ' is equivalent to 1/1,000 millimetre.

The Members of the Scientific Committee are as follows:—

Mr F. Fletcher Hyde BSc FNIMH – Director of Research, National Institute of Medical Herbalists – (1965-), Chairman

Mrs F.A. Hyde BSc – (1965-)

Mrs M.B. Robinson BSc FPS ARIC – (1965-)

Dr M.J.R. Moss BPharm PhD MPS – (1969-1970)

Prof. E.J. Shellard PhD FPS FRIC FLS – (1969-)

Mr J.R. Ward – (1969-)

Dr F.J. Evans BPharm PhD MPS FLS – (1971-)

Mr H. Hall MPS – (1965-), Secretary

Advisory Members:-

Dr T.J. Betts BPharm PhD ARIC – (1965-)

Dr J.B. Williamson MB BS MRCS LCRP MFHom – (1967-)

Dr C.E.R. Winer MB BS MRCS LRCP DObsRCOG LLB – (1965-)

The dates indicate period of membership of the Scientific Committee.

Each member has made a contribution according to his specialized knowledge. Responsibility for the pharmacognostical section has rested on Prof. E.J. Shellard and Dr F.J. Evans. Prof. E.J. Shellard is also engaged on chromatographic examination of the herbs. The pharmacy has been contributed by Mrs M.B. Robinson and Mr H. Hall with advice on formulations and galenicals from Mr J.R. Ward. Mrs F.A. Hyde, in addition to advice in the field of pure botany and chemistry has, with Mrs Robinson, researched into the literature and collated published material. The therapeutic section has been the responsibility of the Chairman who gladly acknowledges help and advice from Dr C.E.R. Winer and Dr J.B. Williamson. The Committee has been put under debt by the efficient and accurate work so ably performed by its Secretary, Mr H. Hall.

F. Fletcher Hyde, *Chairman*

December 1974

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ACONITUM

SYNONYMS

Aconite Root; Monkshood; Wolfsbane.

DEFINITION

Aconitum is the dried root of *Aconitum napellus* L. (Fam. Ranunculaceae), a perennial herb growing wild in central and southern Europe. Aconitum contains not less than 0.5% total alkaloids consisting of aconitine, benzoyleaconine, aconine, mesaconitine, hypaconitine, neopelline, napelline and neoline. Traces of ephedrine and sparteine have been reported together with aconitic acid and starch.

B.P.C. (1973), p.7. Martindale 27th Edn., p.1716.

DESCRIPTION

Macroscopical: Dark brown root up to 10 cm long and 3 cm wide at the crown but tapering to a point at the base; traces of roots and root scars externally, occasionally daughter roots may be present, attached laterally, and an aerial shoot or bud may be present at the crown. Fracture short, bark wide, separated from an inner part by a stellate cambium exhibiting 5-8 projecting angles. Odour slight; taste slight followed by numbness.

Microscopical: Grey-brown powder. Suberised cells of the outer layer containing dark brown, almost black pigment, tabular to rectangular; sclereids, mostly single but may be in groups or associated with parenchymatous cells, large rectangular to oval, with thick pitted walls and a large lumen. Abundant parenchyma of the cortex containing numerous starch grains, simple, spheroidal, 30 μ m in diameter, or up to 6 compound, hilum radiate or slit-shaped. Xylem vessels large, lignified, reticulate or bordered pitted walls, occasionally spirally thickened. Pith of rounded parenchymatous cells. Calcium oxalate absent. Large finely pitted fibres present in samples containing a stem base at the crown.

Jackson & Snowdon, page 136.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 2%.

Content of Stalks: Not more than 5%.

Content of Alkaloids: Not less than 0.5% calculated as aconitine ($C_{34}H_{47}NO_{11}$) by the method of the B.P.C. (1973), p.7.

Thin-Layer Chromatography: Fischer, R. and H. Weixlbaumer, (1965) Pharm. Zentralhalle, 104: 298.

THERAPEUTICS

Action: Topical application followed by parasthesia and numbness of skin.

Indications: Topically: Peripheral neuralgia. Sciatica. Rheumatic pain. Lumbago. Pleurodynia. Contusion and stiffness after injury.

Specific Indication: Local treatment of bruises and pain.

Combinations Used: May be combined with Hamamelis Water.

Precautions: Application must be restricted to unbroken skin. Should a skin reaction occur the treatment should be withdrawn immediately. Percutaneous absorption through the intact skin may cause toxic symptoms.

Preparations: Aconite Liniment B.P.C. (1968). Aconite Tincture B.P.C. (1949).

Maximum Concentration: (Med. Act: Order No. 2130. 1977). Aconitum 1.3% as lotion or one part Aconite Tincture B.P.C. (1949) combined with 9 parts Hamamelis Water. B.P.C. (1973).

Toxicity: The therapeutic dose is so close to the toxic level that this remedy is not suitable for internal administration.

ACORUS

SYNONYMS

Calamus Rhizome; Sweet Flag Root.

DEFINITION

Acorus consists of the dried rhizome of *Acorus calamus* L. (Fam. Araceae). The rhizome is collected in the autumn, trimmed, and sometimes scraped or peeled. It is indigenous to Eastern Europe and Central Asia, where it grows as a reed-like plant over one metre in height. Calamus contains a bitter aromatic volatile oil to the extent of 1.5 to 3.5%. The drug also contains a bitter principle acorin, starch and a tannin. The principal constituents of the volatile oil are asamyl alcohol, eugenol and asarone.

Martindale, 25th Edn., p.617. B.P.C. (1934), p.241. Merck Index, 7th Edn., p.189.

DESCRIPTION OF THE RHIZOME

Macroscopical: The rhizome is longitudinally split into sub-cylindrical pieces 5-20 cm in length and 0.5-1.5 cm in diameter. The unpeeled drug is covered in a thin brown cork and is much shrunken and deeply wrinkled longitudinally. It bears on the upper surface triangular leaf scars and hairlike fibres of fibrovascular tissue, and on the under surface many small root scars. The peeled drug is cream-yellow in colour and exhibits fewer root scars. Calamus breaks with a sharp fracture producing a granular, white, spongy surface internally. The section has a large stele separated by a yellowish line from the cortex. Both the stele and cortex are covered with small oval fibrovascular bundles.

Odour sweet, aromatic and pleasant; taste bitter and pungent.

Microscopical: The powder is yellowish-white and consists largely of masses of whole and broken oval shaped parenchymatous cells. Some of these cells contain a yellow-brown oleo-resin, whilst frequently others are packed with small spherical starch grains. A few xylem elements are present usually in the form of groups of vessels with annular or reticulate thickening.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 1.0%

Gas Liquid Chromatography: Iquchi, M., Nishiyama, A., Kogama, H., Yamanura, S. and Hirata, Y. (1968) Tetrahed. Lettrs., 51 5315-8.

THERAPEUTICS

Action: Carminative. Spasmolytic. Diaphoretic.

Indications: Acute and chronic dyspepsia. Gastritis. Gastric ulcer. Intestinal colic. Anorexia.

Specific Indications: Flatulent colic.

Combinations used: May be combined with Zingiber and/or Dioscorea in flatulent colic. It may be used with Althaea and Filipendula in gastric inflammation.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 1-3 g or by infusion. Liquid Extract 1:1 in 60% alcohol. Dose 1-3 ml. Tincture 1:5 in 60% alcohol. Dose 2-4 ml.

Note: The oil of Acorus is reputed to have 'carcinogenic properties.' American Federal Register 09, May 1968, 33 6937.

ADIANTUM

SYNONYMS

Maidenhair Fern; Venus Hair.

DEFINITION

Adiantum is the dried herb, including rhizomes and rootlets, of *Adiantum capillus-veneris* L. (Fam. Polypodiaceae) a fern common in the Eastern and Central United States. Adiantum contains flavonoids including rutin, isoquercetrin, astragalin, terpenoids including adiantone, tannin and mucilage.

DESCRIPTION

Macroscopical: Whole fronds, up to 30 cm long, two or three times pinnate, petiole and rachis dark brown and shiny, each segment (pinna) bearing numerous alternating pinnules; individual pinnules up to 10 mm long, obovate or fan shaped and narrowed at the base into a short petiolule, crenately lobed in the upper part and with numerous veins converging at the base, margin revolute; sori conspicuous, with a membranous covering, occurring on the extremities of the lobes on the lower surface. Rhizome horizontal, flattened, 3-6 mm wide, covered with narrow brown membranous scales and bearing numerous thin, greyish brown, wiry rootlets. Odour faint; taste slightly astringent.

Microscopical: Powder green-brown. Epidermis of the pinnules composed of longitudinally elongated, very wavy walled cells, often showing underlying network of cells with granular contents; stomata, anomocytic, on the lower surface only; vascular tissue infrequent. Reddish-brown fragments of petiole and rachis with straight walled, narrow and elongated epidermal cells. Sporangia showing characteristic yellow-brown annulus cells with horse-shoe thickening; spores tetrahedral, smooth, colourless, about 40 μ m wide. Rhizome scales composed of elongated cells with slightly thickened walls and brown contents. Calcium oxalate and starch absent.

Foreign Organic Matter: Not more than 2%.

Alcohol (45%) Soluble Extractive: Not less than 22%.

Chromatography: Vanhaelen, M., J. Pharm. Belg. (1970), 25 (3), 175-212.

THERAPEUTICS

Action: Anti-tussive. Expectorant. Demulcent. Mild Astringent.

Indications: Bronchitis. Nasal catarrh. Pharyngitis.

Specific Indication: Chest disorders.

Combinations Used: *Adiantum* may be used with *Lobelia*, *Senega*, *Prunus* and *Grindelia* in bronchitis; with *Prunus* and *Glycyrrhiza* in tracheitis; with *Baptisia*, *Uliginosum*, *Commiphora Resin* and *Capsicum* in nasopharyngeal catarrh.

Preparations and Dosage: (thrice daily)

Dried herb, as infusion. Dose 0.5-2 g. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml.

AGATHOSMA

SYNONYMS

Buchu Leaves; Bucco; *Barosma betulina*. (Bert. and Weidl.)

DEFINITION

Agathosma consists of the dried leaves of *Agathosma betulina* (Berg.) Pillans. (Fam. Rutaceae) collected at the flowering and fruiting stage. The plant is a small shrub native to the Cape Province, South Africa.

Agathosma contains 1.5 to 2.5% volatile oil, which contains 25 to 40% diosphenol, other constituents are limonene and menthone.

Martindale, 25th Edn., p.1509. B.P.C. (1959) p.105.

DESCRIPTION OF LEAF

Macroscopical: Wrinkled, simple, entire leaves, mainly 1 to 2 cm long and 0.6 to 1 cm broad; other much smaller leaves also present, bright green to yellowish-green, darker on the upper surface than lower, obovate or rhomboid-obovate, coriaceous and brittle; margin finely serrate, sometimes revolute; apex blunt and recurved; base, equal and acute; surface glabrous, upper surface strongly papillose due to underlying oil glands, lower surface finely wrinkled; slender stems present up to about 2 mm in diameter, green to red-brown marked with longitudinal ridges. Odour, strongly aromatic, blackcurrant-like; taste strongly aromatic becoming bitter.

Microscopical: Upper epidermal cells fairly large and polygonal with moderately thickened walls, frequently pitted or beaded; lower epidermal cells smaller and more irregular than those of the upper epidermis; abundant anomocytic stomata present in lower epidermis only; mucilage and crystals of diosmin present in the epidermal cells; very occasional thick walled unicellular warted covering trichomes present; large spherical oil glands surrounded by moderately thickened parenchymatous cells; cluster crystals of calcium oxalate present in mesophyll tissue.

Jackson & Snowden, p.42.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Water Soluble Extractive: Not less than 14%.

Paper Chromatography: Pinkas, H., Bezanger-Beauguesne, C. and Lallement, N. (1968) C.R. Acad. Sci. Paris, 267, 1656-9.

THERAPEUTICS

Action: Urinary antiseptic. Diuretic.

Indications: Cystitis. Urethritis. Prostatitis.

Specific Indications: Acute catarrhal cystitis.

Combinations used: Combines well with Althaea in genito-urinary conditions with painful micturition and pyuria.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 1-2 g by infusion. Liquid Extract 1:1 in 90% alcohol.

Dose 0.3-1.2 ml. Tincture 1:5 in 60% alcohol. Dose 2-4 ml.

AGRIMONIA

SYNONYM

Agrimony.

DEFINITION

Agrimonia consists of the dried aerial parts of *Agrimonia eupatoria* L. (Fam. Rosaceae) gathered during flowering or shortly before. The plant is a native British herb up to 60 cm tall, upright, pubescent, with leaves composed of pinnate leaflets of different sizes, bearing a spike of yellow five-petalled flowers with hairy calyces.

Agrimonia contains a volatile oil and an astringent principle.

DESCRIPTION OF CUT HERB

Macroscopical: Mainly green fragments of the toothed, hairy leaflets, the underside being lighter in colour than the upper due to the density of the hairs. Fruit receptacle covered with soft, hooked spines. Stem pieces more or less collapsed and wrinkled, green-brown streaked red, covered with coarse hairs. Odour slight.

Microscopical: Covering trichomes long, unicellular, pointed, somewhat warty with thick, lignified walls showing loose spiral thickening. Glandular trichomes with ovoid heads of 2 to 4 cells supported on bent stalks of 1 to 3 cells. Leaf epidermal cells with sinuous anticlinal walls. Stomata anomocytic, large and sunken, in the lower epidermis only. Large calcium oxalate prisms occur in the mesophyll. Pollen grains spherical, with a smooth exine and 3 furrows, about 45 µm in diameter.
1567.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 12%.

Paper Chromatography: Takahashi & Fujita (1955) J. pharm. Soc. Japan 75 1567.

THERAPEUTICS

Action: Mild astringent. Diuretic.

Indications: Diarrhoea in children, mucous colitis. Grumbling appendicitis. Urinary incontinence. Cystitis.

Gargle: Acute sore throat, chronic nasopharyngeal catarrh.

Combinations used: Has been used with Chelone in rheumatoid arthritis. May be combined with Compound Cardamom Tincture in atonic dyspepsia and with Compound Rhubarb Tincture in gastroenteritis.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-3 ml. Tincture 1:5 in 45% alcohol. Dose 1-4 ml.

AGROPYRON

SYNONYMS

Triticum; Triticum repens; Rhizoma tritici; Radix graminis; Dogs Grass; Twitchgrass; Couchgrass.

DEFINITION

Agropyron is the rhizome of *Agropyron repens* Beauvais (Fam. Gramineae); a grass growing up to 1.5 m in height and found in Europe, Northern Asia, Australia and America. The rhizome is collected in March and April, deprived of roots, cut into short lengths and dried. Agropyron contains the carbohydrate tritacin, about 8%, together with glucose and levulose, mannitol, inositol, a gum substance and some acids.

B.P.C. (1934), p.77. Merck Index, 7th Edn., p.1072. Martindale 25th Edn., p.1517.

DESCRIPTION OF THE RHIZOME

Macroscopical: The rhizome occurs in short cylindrical pieces about 3-20 mm long and 2-4 mm in diameter. The yellow-brown pieces have a hard smooth surface and are longitudinally furrowed. The nodes are small, circular and bear root scars and sometimes short pieces of stem or root. The transverse section is circular, with a narrow band of sclerenchyma beneath the epidermis, a cortex about one-third of the total diameter and a band of pericyclic sclerenchyma. The pith is hollow except at the nodes. Odour none; taste faint but sweet.

Microscopical: The powder is white to yellow in colour and consists largely of fragments of epidermis with hypodermis often attached but sometimes separate. The epidermal cells are rectangular and elongated, being about ten times as long as they are broad, alternating with small circular twin cells. The walls are slightly wavy and silicified, and the surface pitted. Often hypodermal cells are strongly lignified on the lateral walls. The xylem is lignified and consists of spiral, annular or pitted vessels. The sclerenchymatous fibres are long, moderately thick-walled and pitted. Irregular masses of large parenchymatous cells are occasionally to be seen.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 3%.

Water Soluble Extractive: Not specific because of different varieties.

Thin Layer Chromatography: Smith, D. and Grotelescher, R.D. (1966) Crop. Sci., 6, 263-6.

THERAPEUTICS

Action: Diuretic.

Indications: Cystitis. Urethritis. Prostatitis. Benign prostatic hypertrophy. Renal calculus. Lithuria.

Specific Indications: Cystitis with irritation or inflammation of the urinary tract.

Combinations used: May be combined with *Agathosma* in cystitis, and with *Hydrangea* in prostatic enlargement.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 4-8 g or in decoction. Liquid Extract 1:1 in 25% alcohol. Dose 4-8 ml. Tincture 1:5 in 40% alcohol. Dose 5-15 ml.

ALCHEMILLA

SYNONYMS

Ladies Mantle; Lions Foot.

DEFINITION

Alchemilla consists of the dried aerial parts of *Alchemilla vulgaris* L. (Fam. Rosaceae), a robust perennial herb with an erect flowering stem, common to Britain. The herb is collected between May and August. *Alchemilla* contains a glycoside and tannins.

DESCRIPTION

Macroscopical: Stems, yellow-green, 1-5 cm long, 2-4 mm wide, longitudinally striated, hollow. Leaf fragments up to 5 cm in diameter when whole but much broken in the herb, orbicular or reniform, palmately lobed to $\frac{1}{3}$ or less, dark green both sides, pubescent. Lobes 7-11, broad serrate, stipules scarious, sometimes purple tinged. Cauline leaves few, small on a short petiole. Inflorescence, in a leafy cyme, clusters in the axils of leaf-like bracts; flowers, four green triangular sepals alternating with four epicalyx segments, four stamens and one carpel, no petals. Odour faint; taste slightly astringent.

Microscopical: Stems, characteristic collenchyma and bundles of narrow long tapering fibres. Leaf fragments, upper epidermis slightly wavy-walled cells, few stomata, sheaths of calcium oxalate crystals along the veinlets; lower epidermis, wavy-walled cells, frequent anomocytic stomata, narrow, long thick-walled unicellular covering trichomes with pointed ends. Pollen grains, three pores, spherical, pitted exine 15-25 μ m in diameter.

Total Ash: Not more than 6%.

THERAPEUTICS

Action: Astringent, Antihæmorrhagic.

Indications: Diarrhoea. Dysentery, Passive haemorrhage. Menorrhagia. Topically: Leucorrhoea. Pruritus vulvae (douche).

Specific Indications: Acute diarrhoea: epidemic diarrhoea of infants.

Combinations used: In gastroenteritis, may be combined with Agrimonia, Geum or Potentilla: in menorrhagia, with Trillium and Bidens.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol, Dose 2-4 ml.

ALETRIS

SYNONYMS

Unicorn Root, True; Ague Root; Colic Root; Star Grass.

DEFINITION

Aletris consists of the dried rhizomes and roots of *Aletris farinosa* L. (Fam. Liliaceae), a small perennial herb growing throughout Eastern United States of America, collected after flowering. Aletris contains a watersoluble bitter principle.

B.P.C. (1934), p. 85. Martindale 25th Edn., p. 1501.

DESCRIPTION

Macroscopical: Rhizome horizontal and slightly oblique, somewhat contorted, laterally compressed above; from 1-6 cm long and 3-9 mm thick; externally grey-brown; upper surface shows circular stem scars from 3-7 mm in diameter and with numerous leaf bases; the side and lower portions with numerous pale yellow roots which are more or less flexuous and provided with short branches; roots often stripped of their cortical layer exposing red-brown endodermal layer of the stele, giving them a wiry appearance, fracture short, internally light brown, cortex 1-2 mm thick, central cylinder showing fibro-vascular bundles. Odour slight, acetous; taste initially sweet but but then bitter and soapy.

Microscopical: Light brown powder, cortex cells packed with starch grains 2-10 μm in diameter and also with raphides of calcium oxalate 15-35 μm long; fibrovascular bundles consisting of lignified tracheids and lignified parenchyma; sclerenchymatous fibres, pitted and sometimes branched at one end; epidermis and hypodermis two or three layers; numerous small glandular trichomes consisting of unicellular stalk and a sub-spherical head.

Acid Insoluble Ash: Not more than 10%.

Foreign Organic Matter: Not more than 5%.

THERAPEUTICS

Action: Bitter. Spasmolytic. Mild sedative.

Indications: Anorexia. Dyspepsia. Flatulent colic. Reported to be useful in threatened miscarriage.

Specific Indications: Anorexia of nervous dyspepsia.

Combinations used: May be used with Filipendula or Chamaemelum for indigestion.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 0.3-0.6 g or by decoction. Liquid Extract 1:1 in 45% alcohol. Dose 0.3-1 ml. Elixir B.P.C. (1934). Dose 2-4 ml.

ALLIUM

SYNONYM

Garlic.

DEFINITION

Allium is the fresh compound bulb of *Allium sativum* L. (Fam. Liliaceae). The plant is indigenous to South Europe and is widely cultivated. The bulbs contain 0.1-0.3% of volatile oil, containing allyl disulphide and diallyl disulphide. It also contains alliin, allicin, mucilage and albumin.

B.P.C. (1949), p.69. Martindale, 26th Edn., p.710. Merck Index, 8th Edn., p.482.

DESCRIPTION

Macroscopical: Subglobular compound bulbs 3-5 cm broad, consisting of 8-20 cloves, the whole surrounded by 2-5 layers of white scale leaves attached to a flattened circular base. Cloves ovoid and 3-4 sided, summit acute, narrowed into a thread like portion of fibre, base truncate. Each clove is covered with a white scale leaf and a pink-white epidermis easily separated from the solid portion, consisting of two flaky scale leaves and two yellow-green conduplicate foliage leaves. Odour aromatic, taste pungent and persistent.

Microscopical: Outer scale leaves have outer epidermis of elongated, sub-rectangular cells with beaded walls. The hypodermal cells are elongated and thick walled. Each cell contains a prism of calcium oxalate 20-50 μ m in diameter. Inner epidermis consists of elongated beaded walled cells, hypodermis of thick walled elongated cells with triangular intercellular spaces at the corners. Scale leaf cells lignified. Fleshy scale leaves have a thin walled epidermis, a mesophyll of oval parenchymatous cells and faintly lignified annular and spiral vessels.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

Thin Layer Chromatography: Horhammer, L., Wagner, H., Sieta, M., Vejdek, Z.J. (1968). Pharmazie, 23, 462-7.

THERAPEUTICS

Action: Diaphoretic. Expectorant. Spasmolytic. Antiseptic. Bacteriostatic. Antiviral. Promotes leucocytosis. Hypotensive. Anthelmintic.

Indications: Chronic bronchitis. Respiratory catarrh. Recurrent colds. Whooping cough. Bronchitic asthma. Influenza.

Specific Indication: Chronic bronchitis.

Combinations used: Combines well with Tussilago and Lobelia in bronchitis and asthma. May be administered with Baptisia and Echinacea in conditions associated with bacterial or viral activity.

Preparations and Dosage: (thrice daily)

Dried bulb. Dose 2-4 g. Tincture 1:5 in 45% alcohol. Dose 2-4 ml. Syrup BPC (1949). Dose 2-4 ml. Oil. Dose 0.03-0.12 ml.

Note: Only small doses diluted should be administered to children.

ALPINIA

SYNONYMS

Galanga; Colic Root; Chinese Ginger; Lesser Galangal; East Indian Root.

DEFINITION

Alpinia consists of the dried rhizome of *Alpinia officinarum* Hance. (Fam. Zingiberaceae). It is indigenous to Eastern and South-Western Asia and is cultivated there. The rhizome contains 0.5-1.0% of volatile oil, galangol, galangin, kaempferide and dihydroxyflavanol.

B.P.C. (1934), p.474. Martindale, 26th Edn., p.1241.

DESCRIPTION

Macroscopical: Hard, branching, nearly cylindrical pieces 2-12 cm in length and 1-4 cm in width, covered in red-brown cork. The Indian Alpinia is somewhat larger than the Chinese, nearly smooth, longitudinally wrinkled and marked with fine annular scars of bud-scales. The fracture is hard and fibrous, cut surface grey-brown, porous and with a distinct stele and a thick cortex, exhibiting numerous red resin cells and yellowish collateral vascular bundles. Odour pungent, spicy and agreeable; taste pungent.

Microscopical: Reddish brown powder consisting of large-celled parenchymatous tissue, packed with ellipsoidal to ovoid starch grains 2-5 μ m in length with a hilum at the broad end. Secretory parenchyma contains a red-brown resin. Narrow unlignified vessels with annular or scalariform thickening and large septate non-lignified fibres.

Greenish & Collin (1904), p.228. Deryng, p.96.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Carminative. Aromatic. Diaphoretic.

Indications: Dyspepsia. Flatulence. Nausea and vomiting.

Specific Indications: Flatulent colic.

Combinations used: May be combined with Filipendula in dyspepsia or with Althaea and Dioscorea.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 1-2 g or by infusion or decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

ALTHAEA LEAF

SYNONYMS

Marsh mallow; Marshmallow; Guimauve.

DEFINITION

Althaea Leaf consists of the dried leaves of *Althaea officinalis* L. (Fam. Malvaceae, collected when the plant is in flower, containing up to 10% mucilage. B.P.C. (1934), p.96.

DESCRIPTION

Macroscopical: Entire and partly broken, velvety grey-green with long petioles, broadly ovate or slightly cordate at the base, 10-20 cm long and 10 cm wide, with 3-7 angular or rounded lobes, palmate venation and a crenate margin. Occasional flower buds may be present.

Microscopical: The powder is greyish-green. Leaf fragments exhibit anomocytic stomata, straight walled epidermal cells, large rosettes of calcium oxalate. The large, stellate, covering trichomes are distinctive, 3 to 6 forming a group. Occasional glandular trichomes with a unicellular globular head and a short stalk.

THERAPEUTICS

Action: Demulcent. Expectorant. Diuretic. Antilithic. Emollient.

Indications: Bronchitis. Respiratory catarrh. Cystitis. Urethritis. Urinary gravel or calculus. Locally — abscesses, boils, ulcers.

Specific Indications: Respiratory catarrh associated with digestive weakness.

Combinations used: Combines with Marrubium, Glycyrrhiza and/or Tussilago for pulmonary disease. Used in fomentation, poultice and ointment with Ulmus for wounds, ulcers, boils and eczema.

Preparations and Dosage: (thrice daily)

Dried Leaf. Dose 2-5 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-5 ml. Ointment 5% Powdered Althaea Leaf in usual ointment base.

ALTHAEA ROOT

SYNONYMS

Marsh mallow Root; Marshmallow; Guimauve.

DEFINITION

Althaea Root is the dried, peeled root of *Althaea officinalis* L. (Fam. Malvaceae), a perennial cultivated in Belgium, France and Germany. The roots are collected in the autumn from plants at least two years old. They contain 15-20% of mucilage, consisting largely of xylan and glucosans, also sucrose, fatty acid esters, sterols, asparagin and a lecithin.

Martindale, 26th Edn., p.1074. B.P.C. (1934), p.95.

DESCRIPTION

Macroscopical: Pieces of fibrous, cream-white, peeled root, nearly entire, tapering, 20-25 cm long and 5-20 mm in diameter, deeply furrowed longitudinally and having partly detached phloem fibres and a few root scars. The fracture is short granular and fibrous. The transverse surface has a moderately thick, finely radiate white bark, and a brown cambium line separating the cream-yellow wood. Odour faint, taste sweet.

Microscopical: The powder is cream-white and very fibrous, a special feature being its abundant phloem fibres, mainly unligified. Ovoid starch grains occur singly or in small groups. Rosettes of calcium oxalate and a few scalariform or bordered pitted vessels and tracheids are present. Abundant parenchyma, some cells containing mucilage.

Jackson & Snowdon, p.172.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

Chromatography: G. Franz (1966), *Planta. Med.*, 14, 90-110.

THERAPEUTICS

Action: Demulcent. Diuretic. Emollient. Vulnerary.

Indications: Gastritis. Gastric or peptic ulceration. Enteritis. Inflammation of the mouth or pharynx. Respiratory catarrh with irritating cough. Cystitis. Locally — varicose and thrombotic ulcers.

Specific Indications: Gastric or duodenal ulcer.

Combinations used: May be combined with Symphytum in peptic ulceration: with Glycyrrhiza, Marrubium and/or Lobelia for cough. Used with Ulmus for local application as a poultice or ointment for inflammation and crural ulcers.

Preparations and Dosage: (thrice daily)

Dried root. Dose 2-5 g or by cold extraction. Liquid Extract 1:1 in 25% alcohol. Dose 2-5 ml. Syrup (B.P.C. 1949) Dose 2-10 ml. Ointment 5% Powdered Althaea Root in usual ointment base.

AMMONIACUM

SYNONYMS

Ammoniac; Gum Ammoniac.

DEFINITION

Ammoniacum is the gum-resin obtained by exudation from the stem of the flowering and fruiting plant *Dorema ammoniacum* Don. (Fam. Umbelliferae) and possibly other species of *Dorema*. The plants are indigenous to Central and Eastern Iran. Ammoniacum contains 0.1-0.3% of volatile oil, 65-70% of resin consisting mainly of amminoresinol ($C_{24}H_{33}O_4$), gum and free salicylic acid.

B.P.C. (1949), p.81. Martindale 27th Edn., p.250.

DESCRIPTION

Nodular masses or separate pale yellow tears 0.5-3.0 cm in diameter, sometimes dark in colour when aged. Brittle when cold but softening when warm. Fractured surface white to pale brown. Odour characteristic; taste bitter and acrid.

Identification tests:

1. Extract 1 gm of powder with 3 ml of ether and filter. Add 1 drop of ferric chloride solution and a crystal of sodium carbonate. A violet colour is produced.
2. Extract 1 gm of powder with 10 ml of water and add solution of chlorinated lime. An orange-red solution is produced.

Total Ash: Not more than 7.0%.

Alcohol (90%) Soluble Extractive: Not less than 60%.

Ammoniacum complies with the test for freedom from umbelliferone of the B.P.C. 1949. p.81.

THERAPEUTICS

Action: Expectorant. Spasmolytic. Diaphoretic.

Indications: Chronic bronchitis. Asthma.

Combinations Used: Combines with Balsam of Tolu in respiratory disease.

Preparations and Dosage: (thrice daily)

Powdered resin. Dose 0.3-1 g. Emulsion-Ammoniacum, Balsam Tolu, Distilled water 1:2:30. Dose 15-30 ml.

ANETHUM

SYNONYM

Dill.

DEFINITION

Anethum consists of the dried fruit of *Anethum graveolens* L. (Fam. Umbelliferae) an annual herb cultivated in Europe. Anethum contains not less than 2.5% $\%_w$ of volatile oil, 50% of which is carvone.

B.P.C. (1954), p.255. Martindale 27th Edn., p.1017.

DESCRIPTION

Macroscopical: Mericarps normally separate and free of pedicel, oval and glabrous, 3-4 mm long, 2-3 mm wide and 1 mm thick, compressed dorsally and almost flat. Brown to yellow-brown, each mericarp exhibits three pale brown dorsal ridges, the two lateral ridges being extended to form membranous wings. Flat commissural surface exhibits a carpophore as a pale line down the centre. Transverse section shows six vittae, four being dorsal and two commissural and five vascular strands two of which are situated in the wings. Odour and taste aromatic, pleasant and characteristic.

Microscopical: Pale brown powder. Epicarp composed of well defined uniform cells marked with a striated cuticle, infrequent anomocytic stomata; lignified reticulate parenchyma of the mesocarp consisting of elongated cells with thick walls and oval pits. Sclereids of the mesocarp thick-walled but with few pits. Endocarp of lignified, sinuous thin-walled cells elongated in surface view, arranged in groups parallel to one another, often associated with larger thick-walled mesocarp cells. Infrequent fragments of vittae with brown-yellow polygonal thin-walled cells. Endosperm parenchyma of thick-walled, oval to rectangular cells containing fixed oil and aleurone grains about 5 μ m in diameter, occasionally enclosing microspheroidal crystals of calcium oxalate. Starch absent.

Jackson and Snowdon, p.132.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3.0%.

Foreign Organic Matter: Not more than 2.0%.

Thin-Layer Chromatography: Betts, J. (1964), *J. Pharm. Pharmacol.*, Suppl. 16: 131.

THERAPEUTICS

Action: Carminative.

Indications: Flatulent dyspepsia. Tormina.

Specific Indication: Flatulent pains in infants.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 1-4 g or by infusion. Distilled Dill Water B.P.C. (1949).
Dose 2-4 ml.

ANGELICA LEAF

DEFINITION

Angelica Leaf consists of the dried leaves of *Angelica archangelica* L. (Fam. Umbelliferae). The plant is a perennial herb, indigenous to Northern Europe and Asia, up to 2 or 3 m tall, with a green grooved hollow stem, large 2-3 pinnate leaves and umbels of greenish-white or green flowers.

Angelica Leaf yields about 0.1% of volatile oil containing furanocoumarins.

DESCRIPTION

Macroscopical: Leaves bi- or tri-pinnate, deltoid, lower primary leaves long stalked, leaflets obliquely-oblong-ovate, margin acutely serrate, reticulately veined, grey-green on under surface, olive-green on upper petioles yellow-green to purplish in colour, laterally compressed, deeply channelled on upper side and somewhat decurrent, dilated and sheathing at base. Odour faintly aromatic; taste sweet and characteristic.

Microscopical: Dorsiventral leaf; upper and lower epidermal cells with sinuous anticlinal walls and striated cuticle; stomata anomocytic, confined to lower epidermis; mesophyll cells stellate, those adjacent to the main veins containing crystalline masses; vessels from lamina with fine spiral thickening; vessels from petiole lignified with spiral, annular and reticulate thickening; epidermis from petiole with beaded straight anticlinal walls; parenchyma of petiole containing yellow globules of oil.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 4%.

Water Soluble Extractive: Not less than 20%.

Chromatography: Neilsen, B. E. (1970) Dansk Tidsskr. Farm. 44, 111. Steck W. & Bailey, B. K. (1969) Canad. J. Chem. 47 2425.

THERAPEUTICS

Action: Carminative.

Topically: Anti-inflammatory.

Indications: Flatulent dyspepsia. Pleurisy.

Specific Indications: Pleurisy and bronchitis applied as compress.

Combinations used: May be combined with Chamaemelum for digestive weakness.

Preparations and Dosage: (thrice daily)

Dried leaf. Dose 2-5 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-5 ml. Tincture 1:5 in 45% alcohol. Dose 2-5 ml.

ANGELICA ROOT

DEFINITION

Angelica root consists of the dried roots and rhizomes of *Angelica archangelica* L. (Fam. Umbelliferae) collected in the Autumn. The plant is a perennial herb, indigenous to northern Europe and Asia, up to 2 to 3 m high with a green grooved hollow stem and large 2-3 pinnate leaves and umbels of greenish-white or green flowers.

Angelica root contains volatile oil, angelic acid and resin.

Martindale, 25th Edn., p.690. B.P.C. (1934) p.128.

DESCRIPTION OF CUT ROOT

Macroscopical: Irregular light brown pieces of rhizome and short lengths of root 1-2 mm in diameter. Thick, dark brown cork on some pieces of rhizome. Fracture short and granular. Odour sweet and characteristic; taste sweet becoming slightly bitter and astringent.

Microscopical: Powder light brown. Abundant starch grains, simple, spherical or in compound masses, up to 12 μm but mainly about 4 μm in diameter. Abundant cork, polygonal or elongated rectangular cells, often lignified, with brown contents. Xylem vessels lignified with reticulate thickening, isolated or in groups. Fibres absent. Xylem parenchyma occasionally lignified, other thin-walled parenchyma cells contain oil droplets. Occasional isolated clusters of calcium oxalate.

Deryng, p.46.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

THERAPEUTICS

Action: Spasmolytic. Diaphoretic. Expectorant. Bitter aromatic. Carminative. Diuretic.

Indications: Respiratory catarrh. Psychogenic asthma. Flatulent dyspepsia. Anorexia nervosa. Rheumatic diseases. Peripheral vascular disease.

Specific Indications: Bronchitis associated with vascular deficiency.

Combinations used: Combines well with Tussilago for bronchial catarrh; with Chamaemelum for anorexia and dyspepsia.

Preparations and Dosage: (thrice daily)

Dried root and rhizome. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml. Tincture 1:5 in 50% alcohol. Dose 0.5-2 ml.

APHANES

SYNONYMS

Parsley Piert; *Alchemilla arvensis*.

DEFINITION

Aphanes consists of the dried aerial parts of *Aphanes arvensis* L. (Fam. Rosaceae) gathered during the flowering period. The plant is a native British herb, up to 20 cm tall, with radiating branches, delicately hairy, with small, three-lobed, fan-shaped leaves, bearing insignificant axillary tufts of small green flowers without petals.

Aphanes contains an astringent principle.

DESCRIPTION OF CUT HERB

Macroscopical: Mainly leaf fragments, flat, folded, silky grey-green on the lower side, dark green and glabrous on the upper side. Fruits and flowers numerous, about 2 mm long, with four, spreading, silky grey-green sepals. Stem pieces thin, hollow, appearing glabrous, pale green. Taste astringent.

Microscopical: Covering trichomes of the leaves and sepals, long, narrow, unicellular, thick-walled, lying parallel with each other, pointing towards the apex, forming a dense, silky covering. Leaf epidermis with sinuous anticlinal walls, delicately beaded. Stomata anomocytic, occurring densely in the lower epidermis only. Calcium oxalate prisms, large, around the veins.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

THERAPEUTICS

Action: Diuretic; dissolves urinary deposits. Demulcent.

Indications: Kidney and bladder calculi. Dysuria. Strangury. Oedema of renal and hepatic origin.

Specific Indications: Renal calculus.

Combinations used: May be used with Agathosma or Scoparium. Althaea combines well as a demulcent.

Preparations and Dosage: (thrice daily)

Dried plant. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-10 ml.

APIUM

SYNONYMS

Celery Fruit, Celery Seed.

DEFINITION

Apium consists of the dried ripe fruits of the cultivated plants of *Apium graveolens* L. (Fam. Umbelliferae). The plant is a strongly smelling erect biennial herb, 30 to 60 cm tall, indigenous to England and extensively cultivated in the temperate regions of Europe and North America, with shiny pinnate leaves, having large toothed leaflets, the upper trifoliate and unstalked. Flowers white, in sessile or shortly stalked umbels often opposite the leaves; no upper or lower bracts.

Apium contains 2 to 3% volatile oil and some fixed oil.

Martindale 25th Edn., p.1513. B.P.C. (1949) p.106.

DESCRIPTION OF FRUITS

Macroscopical: Mericarps and cremocarps: cremocarp brown, roundish-ovoid, laterally compressed, about 1 to 1.5 mm long, 1.5 mm wide and 0.5 mm thick, sometimes with a slender straight pedicel; each mericarp has 5 yellowish primary ridges and a nearly flat commissural surface. Odour aromatic, characteristic of celery; taste aromatic, slightly camphoraceous.

Microscopical: Powder dark brown. Epicarp, somewhat elongated cells with slightly sinuous walls in surface view with anomocytic stomata and striated cuticle, papillae seen on fragments of epicarp in side view; vittae, fairly numerous fragments composed of large polygonal thin walled cells in surface view; sclereids of mesocarp occasional, ovoid to rectangular with pitted, moderately thickened lignified walls; endocarp, a layer of thin walled cells elongated in surface view, arranged in groups of 6 or more cells parallel to one another often with differences in orientation of the adjacent groups; endosperm, cells with thick cellulosic walls, containing aleurone grains with microsphaeroidal crystals of calcium oxalate; vascular tissue of lignified vessels and tracheids present.

Jackson & Snowdon, p.126.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 12%.

Gas Liquid Chromatography: Wilson, C.W. (1965), Proc. Florida State Hort. Soc., 28, 249-52.

Thin Layer Chromatography: Hörhammer, L., Wagner, H. and Kraemer-Heydweiller, D. (1966) Dt. Apothztg., 106, 267-72.

THERAPEUTICS

Action: Antirheumatic. Sedative. Urinary antiseptic.

Indications: Rheumatism. Arthritis. Gout. Inflammation of the urinary tract.

Specific Indications: Rheumatoid arthritis with mental depression.

Combinations used: May be combined with Menyanthes and/or Guaiacum in rheumatic disease. Therapeutic action appears to be potentiated by Taraxacum.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 0.5-2 g or by decoction 1:5. Liquid Extract 1:1 in 60% alcohol. Dose 0.3-1.2 ml. (B.P.C. 1934) 1:1 in 90% alcohol. Dose 0.3-1.2 ml.

ARCTOSTAPHYLOS

SYNONYMS

Bearberry Leaves, Uva Ursi.

DEFINITION

Arctostaphylos consists of the dried leaves of *Arctostaphylos uva-ursi* Spreng. (Fam. Ericaceae). It is a small evergreen shrub indigenous to Europe, Asia and the northern United States and Canada, where it grows on rocky hills. *Arctostaphylos* contains 6-7% of tannin, gallic and ellagic acids, the glycosides arbutin and methylarbutin, quercetin and a resin ursone and myricetin.

B.P.C. (1934), p. 1089. Martindale 27th Edn., p. 1725.

DESCRIPTION

Macroscopical: Leaves obovate, spatulate, 12-30 mm in length, 5-13 mm in breadth; summit obtuse; base acute, tapering; margin entire and slightly revolute. Upper surface green, glabrous, finely reticulate; lower surface yellow-green; petiole about 3 mm long, slightly pubescent. Odour slight; taste slightly bitter and astringent.

Microscopical: Yellow-green to green powder; fragments of polygonal epidermal cells associated with broadly elliptical anomocytic stomata; mesophyll cells contain irregular crystalline masses of calcium oxalate; fragments of fibrovascular bundles with spirally thickened lignified tracheids and narrow lignified sclerenchymatous fibres occasionally associated with monoclinic prisms 5-30 μ m in diameter; numerous parenchyma cells containing a yellow resin.

Total Ash: Not more than 4%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 5%.

Chromatography: Kawano, N., Miura, H. and Kikuchi, H., (1964), J. Pharm. Soc. of Japan, 84, 469.

THERAPEUTICS

Action: Diuretic. Urinary antiseptic. Astringent.

Indications: Cystitis. Urethritis. Dysuria. Pyelitis. Lithuria.

Specific Indications: Acute catarrhal cystitis with dysuria and highly acid urine.

Combinations used: May be combined with Althaea Root, Agropyron, Zea and Agathosma in cystitis.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 1.5-4 g or by infusion. Concentrated Infusion B.P.C. (1934).

Dose 2-4 ml. Liquid Extract 1:1 in 25% alcohol. Dose 1.5-4 ml.

ARNICA

SYNONYMS

Arnica Flowers; Leopard's Bane; Wolf's Bane; Mountain Tobacco.

DEFINITION

Arnica consists of the dried flowerheads of *Arnica montana* L. (Fam. Compositae), a small herbaceous perennial, indigenous to Central Europe. Arnica contains 0.5-1% of a volatile oil, anthoxanthine, a bitter principle arnicin, arnisterol, flavonoids, tannins and resin.

Merck Index 9th Edn., 815 B.P.C. (1949), p. 116. Martindale 27th Edn., p. 217.

DESCRIPTION

Macroscopical: The dried capitula are obconical masses about 20 mm in diameter and 15 mm high. Many receptacles separate, up to 8 mm (mostly 5.5 mm) in diameter, flat or slightly convex and marked by numerous depressions, with two rows of dark-green, linear-lanceolate, pubescent involucre bracts. Separate loose masses of light brown-yellow florets with inconspicuous corollas and pappus bristles are a most prominent feature; ligulate florets, 16-20 in a single row, from 2-3.5 cm long, with conspicuous, orange-yellow corollas, terminating in 3, occasionally 4-5, acute teeth and traversed by 7-9, or rarely up to 15, veins; calyx represented by a pappus of numerous bristles; no stamens; stigma bifid and separating, ovary inferior. Numerous disc florets with 5-toothed, yellow, tubular corolla about 7-8 mm long; 5 epipetalous stamens; fruit about 5.5-7.5 mm long; ovaries and fruit 5-ribbed unilocular and surmounted by pappus. Odour aromatic; taste bitter and acrid.

Microscopical: Epidermis of corolla papillose, containing yellow-orange globular masses, some cells of corolla also containing dark brown-black patches of phytomelan; base of corolla tube of ligulate florets with uniseriate covering trichomes of 4-6 cells, up to 1 mm in length; bristles of pappus 4-6 cells in diameter nad barbed by exertion of the pointed apices of the cells; abundant black patches of phytomelan in cells of ovary or fruit wall; corolla and ovary wall with numerous compositous glandular trichomes; ovary wall with numerous appressed twin hairs each composed of 2 narrow parallel cells diverging at the tips; spiky spherical pollen grains, mostly 35 μ m but up to 52 μ m diameter with finely granular exine, spines up to 8 μ m long, and with 3 pores and furrows.

Total Ash: Not more than 8%.

Foreign Organic Matter: Not more than 2%.

Receptacles with Attached Involucres: Not more than 25-33%.

Alcohol (45%)-Soluble Extractive: Not less than 15%.

Thin-Layer Chromatography: Brunner, H. (1970) Deut. Apoth.-Ztg. 110, 267.
Duquenois, P. (1971) Pharm. Weekbl. 106, 190.

THERAPEUTICS

Action: Topically: counter irritant.

Indications: Topically: bruises, sprains, unbroken chilblains, alopecia neurotica.

Specific Indications: Sprains, bruises as topical application.

Combinations used: Combined with Hammamelis as topical application for bruises and sprains.

Preparation:

Tincture B.P.C. (1949). For external application.

Note: This remedy is poorly tolerated by some people. It must only be applied to the unbroken skin. Withdraw on first sign of dermatitis.

ARTEMISIA ABROTANUM

SYNONYMS

Southernwood; Lad's Love.

DEFINITION

Artemisia Abrotanum is the dried aerial parts of *Artemisia abrotanum* L. (Fam. Compositae), a perennial, aromatic, shrubby plant growing up to 1 m in height. The herb is common to Europe and Great Britain and is much cultivated. *Artemisia Abrotanum* is collected from June to August and contains volatile oil.

DESCRIPTION

Macroscopical: Stems red-brown to green-brown, grooved longitudinally and angled, 1-4 cm long and 2.5 mm thick, with a large central pith and a narrow green to brown periphery. Leaves 2-4 cm long, one to three times pinnate, filiform, punctate segments, glabrous on the upper and tomentose on the lower surfaces. Rachis green to dark brown, tomentose, cylindrical 1-5 cm long. Inflorescence heads, ovoid 1-3 mm in diameter, numerous, in racemes, often broken in the herb. Florets yellow-brown, rare. Achenes ovoid, pale brown. Odour characteristic; taste aromatic.

Microscopical: Green-brown powder; stem fragments characterised by bundles of long thin-walled narrow fibres, occasionally finely pitted. Leaf fragments, upper surface glabrous, epidermal cells, almost straight beaded anticlinal walls, stomata absent; lower surface, covering trichomes of two types, stout bi- or tri-cellular, thick walled, narrow-lumen covering trichomes and matted flexible thin-walled T-shaped trichomes; epidermal cells wavy-walled, faintly striated cuticle, numerous anomocytic stomata. Florets, yellow brown, elongated epidermal cells, pollen spherical, three pores, smooth exine, 20-25 μ m in diameter.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Emmenagogue. Anthelmintic. Bitter. Antiseptic.

Indications: Delayed menstruation, Worms in children.

Specific Indications: Amenorrhoea, associated with neurosis. Thread worms in children.

Combinations used: Combines well with Chamaelirium in delayed menses.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

ARTEMISIA ABSINTHIUM

SYNONYMS

Wormwood; Common Wormwood.

DEFINITION

Artemisia Absinthium consists of the dried leaves and flowering tops of *Artemisia absinthium* L. (Fam. Compositae), a shrubby perennial herb growing in the United States and Canada. It is cultivated in N. Africa, Europe and the U.S.A. The flowering tops are collected during the late summer. *Artemisia Absinthium* yields about 1% of volatile oil containing thujone (absinthol), thujyl alcohol and iso-valeric acid. It contains, in addition absinthin and a bitter glycoside.

B.P.C. (1934), p. 2. Martindale 27th Edn., p. 253.

DESCRIPTION

Macroscopical: Leaves 5-12 cm long, 2-3 pinnately divided, the lobes abovate or lanceolate entire or toothed; the lower lobe is petiolate. Flower heads green-yellow 2-3 mm long, 1-2 mm in diameter, ovoid or hemispherical and arranged in panicles, the involucre scales occurring in two series, the inner linear with membranous margins, the florets tubular. Odour aromatic; taste bitter.

Microscopical: Green-yellow powder; numerous pollen grains, spheroidal, three pores and a spiny exine, 30 μ m in diameter. Fragments of bracts from the florets, epidermis of thin-walled elongated cells and some glandular trichomes with a 2-celled stalk; calcium oxalate rosettes 10 μ m in the mesophyll of the florets. Leaf and bract fragments with slightly wavy to straight anticlinal-walled epidermal cells; trichomes of two types – T-shaped covering trichomes with a uniseriate stalk of up to 3 cells and a long tapering unicellular head; unicellular covering trichomes very long and much twisted. Secretory canals adjacent to the endodermis and also in the pith of the stem. Stem fibres lignified, vessels spirally thickened.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 1.3%.

Foreign Organic Matter: Not more than 5%.

Thin-Layer Chromatography: Imre, M., (1963), *Herba Hung.*, 2, 157.

THERAPEUTICS

Action: Bitter. Stomachic. Choloretic. Anthelmintic.

Indications: Nematode infestation. Anorexia. Atonic dyspepsia.

Specific Indication: Infestation with *Enterobius* or *Ascaris*.

Combinations used: May be combined with *Juglans* as a vermifuge for children.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

ARTEMISIA VULGARIS

SYNONYMS

Mugwort; Felon Herb; Wild Wormwood; St. John's Plant.

DEFINITION

Artemisia Vulgaris is the dried aerial parts of *Artemisia vulgaris* L. (Fam. Compositae), a herb indigenous to Britain. The plant attains 1.5 m and may be distinguished from other British species of *Artemisia* by the pinnatisect leaves which are white on the underside. The herb is collected when in flower, from July-September. *Artemisia Vulgaris* yields a volatile oil containing cineole, thujone, α and β pinenes; a triterpene fermenol, α amyrin, β sitosterol and sesquiterpene lactones including vulgarin.

DESCRIPTION

Macroscopical: Loosely felted masses composed of leaf and stem fragments together with flowering heads. Stem pieces up to 2 cm long, 1 cm diameter, frequently brown to purplish, longitudinally grooved and with a large white central pith. Leaf fragments dark green on the upper surface, lower surface greyish-white and densely pubescent, margins revolute, entire or coarsely dentate, main veins faintly translucent. Flower heads 3-4 mm long, 2-3.5 mm wide, narrowly campanulate to ovoid, involucre bracts lanceolate to oblong, densely hairy with scarious margins; florets numerous, about 2 mm long, corolla reddish brown; achenes about 1 mm long, brown and glabrous. Odour aromatic and characteristic; taste slight.

Microscopical: Upper epidermal cells of leaf fragments with slightly sinuous walls and occasional covering trichomes, lower epidermal cells obscured by covering of very abundant trichomes, each trichome with a short uniseriate stalk of 2 or 3 small cells on which is inserted at right angles and asymmetrically, a large, much elongated, frequently tortuous cell tapering at each end, forming a T shaped structure; stomata anomocytic, on lower epidermis only. Epidermal cells of the involucre bracts elongated with lignified walls and abundant T shaped trichomes similar to those on the leaf. Epidermis of corolla lobes prosenchymatous with lignified walls and occasional biseriate glandular trichomes of the compositous type. Ovary wall with typical alternating longitudinal files of tangentially and longitudinally elongated cells with numerous glandular compositous trichomes; underlying tissue of the ovary containing microspheroidal crystals of calcium oxalate. Stigma lobes papillose. Fibrous layer of anthers with characteristic beaded walls; abundant spherical pollen grains with 3 distinct pores and a finely warted exine. Groups of lignified fibres and large celled pith parenchyma of the stem.

THERAPEUTICS

Action: Emmenagogue. Orexigenic. Stomachic. Choleric. Anthelmintic.

Indications: Delayed or irregular menstruation. Anorexia. Nervous dyspepsia. Thread worm and round worm infestation.

Specific Indication: Functional amenorrhoea. Dysmenorrhoea.

Combinations Used: Combines with Chamaelirium, Mentha Pulegium and Artemisia Abrotanum in menstrual irregularity: with Tanacetum and Picrasma in threadworm and roundworm.

Preparations and Dosage: (thrice daily)

Dried herb, as infusion. Dose 0.5-2 g. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml.

Note: Large doses should be avoided.

ASAFOETIDA

SYNONYMS

Devil's dung; Asant.

DEFINITION

Asafoetida is the oleo-gum resin obtained by incising the living rhizomes and roots of *Ferula assa-foetida* L. (*F. rubricaulis* Boiss), *F. foetida* (Bunge) Regel and other species of *Ferula* (Fam. Umbelliferae). The plants are perennial herbs indigenous to Eastern Iran and Western Afghanistan. Asafoetida contains 6-17% of volatile oil consisting of sulphated terpenes ($C_7H_4S_2$ and $C_{11}H_{10}S_2$), 40-60% of resin consisting of free and esterified asaresinotannol, ferulic acid and about 25% of gum.

B.P.C. (1949), p.119. Martindale 27th Edn., p.250.

DESCRIPTION

Irregular masses of agglutinated tears up to about 4 cm long, or rounded to ovoid tears 25 mm in diameter; white-grey to grey-yellow in colour, freshly exposed surface white changing to pink or red. Forms a white emulsion with water. Odour powerful, persistent and alliaceous; taste bitter, alliaceous and acrid.

Identification tests:

1. On the application of a drop of sulphuric acid to the surface a red colour is produced.
2. The application of a drop of nitric acid to the surface produces a green colour.
3. When boiled with hydrochloric acid and the cooled solution made alkaline and diluted a blue fluorescence is produced.

Total Ash: Not more than 15%.

Asafoetida complies with the tests for alcohol-insoluble matter and free umbelliferone of the B.P.C. (1949), p.120.

THERAPEUTICS

Action: Carminative. Spasmolytic. Expectorant.

Indications: Flatulent colic. Chronic bronchitis. Pertussis. Laryngismus stridulus. Hysteria.

Specific Indication: Intestinal flatulent colic.

Combinations Used: May be combined with *Acorus* and *Zingiber* in tormina and to prevent griping of laxatives; with *Valeriana* and *Passiflora* in hysteria and other neuroses; with *Lobelia*, *Marrubium* and *Grindelia* in bronchitis and bronchitic asthma.

Preparations and Dosage: (thrice daily)

Powdered resin. Dose 0.3-1 g. Tincture B.P.C. (1949). Dose 2-4 ml.

ASCLEPIAS

SYNONYMS

Pleurisy Root.

DEFINITION

Asclepias consists of the dried underground parts of *Asclepias tuberosa* L. (Fam. Asclepiadaceae). The plant is a native of North America. *Asclepias* contains glycosides, including asclepiadin.

DESCRIPTION OF CUT ROOT

Macroscopical: Irregular grey-white pieces, with grey-brown cork on some surfaces, broken slices, composed of concentric cylinders of tissue which can be readily separated. Fracture short and starchy. Taste nutty. Treatment with sulphuric acid (80% v/v) turns the pieces red-purple in a few minutes.

Microscopical: (Powder) Cork cells tabular, slightly lignified, brown. Xylem elements few, with reticulate thickening or bordered pits, up to about 100 μ m in diameter. Mainly parenchyma containing many starch grains, spherical single grains and angular compound grains with an obvious central point hilum, the individual grains being about 3 to 15 μ m in diameter. Sclerenchymatous elements present, sclereids isolated and in groups, and small fibres in groups. Calcium oxalate prisms present.

U.S.D., 22nd Edn., p.1256.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 8%.

THERAPEUTICS

Action: Diaphoretic. Expectorant. Antispasmodic. Carminative.

Indications: Bronchitis. Pneumonitis. Pleurisy. Influenza.

Specific Indications: Pleurisy.

Combinations used: May be combined with *Capsicum*, *Lobelia* and/or *Grindelia* in pulmonary congestion.

Side Effects: Very large quantities are reputed to cause diarrhoea and vomiting.

Preparations and Dosage: (thrice daily)

Dried root. Dose 1-4 g or by infusion. Liquid Extract 1:1 in 45% alcohol.
Dose 1-4 ml. Tincture 1:10 in 45% alcohol. Dose 1-5 ml.

ATROPA

SYNONYMS

Belladonna Herb.

DEFINITION

Atropa consists of the dried aerial parts of *Atropa belladonna* L. (Fam. Solanaceae), a tall branching perennial herb indigenous to Europe, including Britain. *Atropa* is collected when in flower and contains not less than 0.30% of total alkaloids expressed as hyoscyamine. (-)-Hyoscyamine and atropine are the major constituents together with hyoscyne (scopolamine), belladonnine and other alkaloids including volatile pyridine and pyrrolidine bases.

European Pharmacopoeia vol.1, p.257.

B.P.C. (1973), p.42, Martindale 27th Edn. p.229. B.P (1980), p.46.

DESCRIPTION

Macroscopical: Leaves green to green-brown, lighter on the lower surface, often folded and broken. Whole leaves 5-25 cm long and up to 12 cm wide at the broadest point, elliptical to ovate, margin entire, apex acuminate, narrowing at the base, pubescent, particularly on the young leaves. Petioles 0.5-5.0 cm long, stems hollow and flattened. Flowers purple or brown, campanulate corolla, 2 cm long and 1.5 cm wide, five short reflexed lobes, five epipetalous stamens and one superior bilocular ovary with numerous ovules. Odour nauseous; taste unpleasant and bitter.

Microscopical: Green-yellow powder. Epidermal cells with wavy anticlinal walls and a striated cuticle; stomata anisocytic on both surfaces; covering trichomes multicellular and uniseriate; glandular trichomes of two types, short, clavate with multicellular head or long with uniseriate stalk and a unicellular head. Idioblasts of calcium oxalate microspheonoidal crystals in the mesophyll. Pollen grains spheroidal, 3 furrows and 3 pores, up to 50 μ m in diameter, exine finely pitted. Wide xylem vessels with bordered pits and fibres from the stems.

Jackson and Snowdon, p.40.

Identification and Assay: *Atropa* complies with the identification reaction, chromatographic test and assay procedure of the European Pharmacopoeia, vol.1, pp.259-260.

THERAPEUTICS

Action: Anticholinergic. Spasmolytic. Antasthmatic. Anhidrotic.

Indications: Intestinal colic. Renal and gall-bladder colic. Ptyalism. Hyperhidrosis. Pertussis. Asthma.

Specific Indication: Intestinal colic.

Contra-Indications: Avoid in tachycardia, glaucoma, prostatic hypertrophy and paralytic ileus.

Combinations Used: May be combined with Zingiber, Acorus and Cinnamomum Cassia in intestinal colic: with Prunus, Pilosella and Thymus Vulgaris in pertussis: with Salvia in excessive perspiration.

Preparations and Dosage: (thrice daily)

Dried herb as infusion. Dose 30-100 mg. Tincture B.P. (1980). Dose 0.5-2 ml.

Side-effects include dry mouth, dysphasia, pupil dilation, photophobia, stertorous breathing and mental confusion.

Note: Unstable in alkaline preparations.

AVENA

SYNONYM

Oats.

DEFINITION

Avena consists of the dehusked and rolled starchy seed endosperm of *Avena sativa* L. (Fam. Gramineae).

Avena contains much starch, some protein and a little fat which contains some tocopherol.

DESCRIPTION

Macroscopical: Creamy white and buff, flaky masses. Taste mealy.

Microscopical: Mainly starch in ovate compound grains of 2 to many rounded-polyhedral grains, with many single grains of which some are lemon – or spindle-shaped, the individual grains being 3 to 12 μ m. On clearing the starch, oil globules are visible, and an aleurone layer of thick-walled cells with granular contents adjoining a layer of thin-walled, elongated cells in which occur a few thick-walled, small, circular cells.

U.S.D., 22nd Edn., p.208-9.

THERAPEUTICS

Action: Antidepressive. Thymoleptic. Cardiac tonic.

Indications: Depression. Melancholia. Menopausal neurasthenia. General debility.

Specific Indications: Depressive states.

Combinations used: May be used with Cypripedium or Scutellaria.

Preparations and Dosage: (thrice daily)

Liquid Extract 1:1 in 25% alcohol. Dose 0.6-2.0 ml. Tincture 1:5 in 45% alcohol. Dose 1-5 ml.

BALLOTA

SYNONYM

Black Horehound.

DEFINITIONS

Ballota consists of the dried aerial parts of *Ballota nigra* L. (Fam. Labiatae) gathered during the flowering period. The plant is a native British herb, up to 100 cm tall, unpleasant smelling, downy, with orbicular, coarsely crenate leaves, bearing axillary whorls of pale purple flowers with funnel-shaped calyces.

Ballota contains flavonoids.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf pieces folded in masses, dull green and hairy. Many small groups of flattened, tubular calyces opening at the mouth to a five-pointed fan, green-purple, up to 1 cm long. Fruits, tetrahedral nutlets, shiny, blackish brown about 2 mm. long. Many stem pieces somewhat quadrangular, hollow, dull green-brown, often split showing pithy interior. Taste bitter.

Microscopical: Covering trichomes of the leaf up to 1 mm long, uniseriate, of 2 or 3 cells, slightly bent, finely warted, pointed. Glandular trichomes of the leaf of the multicellular labiate type and also with unicellular or bicellular heads on a unicellular stalk. Leaf epidermis with slightly sinuous anticlinal walls. Stomata diacytic and closely packed on the lower surface. Covering trichomes of the calyx similar to those of the leaf, up to 650 μ m long. Glandular trichomes of the calyx with a stalk of about 3 thin-walled, collapsed cells bearing a pyriform, multicellular head. Calcium oxalate absent, but leaf tissues contain many birefringent crystals.

THERAPEUTICS

Action: Antemetic. Sedative. Mild astringent.

Indications: Nausea, vomiting. Nervous dyspepsia.

Specific Indications: Vomiting of central origin.

Combinations used: May be combined with *Filipendula* and/or *Chamaemelum* in nervous dyspepsia and vomiting of pregnancy. Used with *Leonurus* in false labour pains.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 1-3 ml. Tincture 1:10 in 45% alcohol. Dose 1-2 ml.

BAPTISIA

SYNONYMS

Wild Indigo; Indigo Weed; False or Yellow Indigo.

DEFINITION

Baptisia consists of the dried root of *Baptisia tinctoria* R.Br. (Fam. Leguminosae), indigenous to Canada and the United States of America, collected in Autumn. It has been reported to contain a range of flavonoids (especially flavones and isoflavones), coumarins and the alkaloid cytisine. B.P.C. (1934), p. 180.

DESCRIPTION

Macroscopical: Pieces of root vary from 0.2 to 1.5 cm in diameter and up to about 10 cm in length; pieces of root stock also present; the external surface is brown and longitudinally wrinkled to deeply grooved, somewhat warty due to the detachment of the wiry rootlets which are also present in the drug; fracture short and fibrous the transverse surface exhibiting a thick greyish-brown bark, which easily separates from the yellowish-brown, radiate porous wood. Odour slight; taste bitter and acrid.

Microscopical: Powder yellowish-brown and very fibrous; numerous starch grains present, simple or compound with 2 to 4 components, individual grains from 3 to 6 to 20 μm in diameter; groups of non-lignified small-lumen phloem fibres 12 to 30 μm wide, xylem fibres lignified; xylem vessels, up to 120 μm in diameter, lignified with bordered pits or reticulate thickening; lignified and pitted medullary ray cells and bark parenchyma containing starch; some medullary ray cells with yellow-brown contents; thin-walled tabular cork cells, some slightly lignified, with brown cell contents.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1%.

Chromatography: Markham, K. R., Mabry, T. J. and Swift, T.W. (1970), *Phytochemistry*, 9, 2359.

THERAPEUTICS

Action: Antimicrobial. Antipyretic. Antiseptic. Mild cardioactive agent.

Indications: Tonsillitis, Pharyngitis, Acute Catarrhal Infection, Lymphadenitis, Furunculosis, Aphthous ulcers. Stomatitis, Gingivitis, Fevers. Topically: Indolent ulcers, applied as ointment. 1 part Liquid Extract in 8 parts base. Sore nipples. Leucorrhoea as douche.

Specific Indication: Infection of the upper respiratory tract.

Combinations used: Combines with Echinacea, Capsicum, Myrrh in throat infections: with Phytolacca, Viola Odorata and Arctium in lymph-node inflammation and furunculosis. For the treatment of Aphthous ulcer or stomatitis may be combined with Cephælis.

Preparations and Dosage: (thrice daily)

Dried root. Dose 0.5-1.0 g or by decoction. Liquid Extract 1:1 in 60% alcohol. Dose 0.3-1.3 ml. Tincture B.P.C. (1934). Dose 2-5 ml.

BERBERIS

SYNONYMS

Berberidis Cortex; Barberry Bark.

DEFINITION

Berberis Bark consists of the dried root and/or stem bark of *Berberis vulgaris* L. (Fam. Berberidaceae) and perhaps other related species. The plant is a native British shrub, up to 2.5 m tall, spiny, with obovate leaves, bearing pendulous yellow flowers succeeded by oblong red berries.

Berberis Bark contains yellow alkaloids including berberine and oxyacanthine and chelidonic acid.

B.P.C. (1934) p.201.

DESCRIPTION OF CUT BARK

Macroscopical: Brittle, laminar pieces up to 2 mm thick, some cut diagonally to the grain, curves or nearly flats. Outer surface with slightly rugose cork on most pieces, grey-brown. Inner surface striated longitudinally, obviously yellow, pale to dark, varying in single pieces, with a few pieces of incompletely removed whitish-buff wood. Fracture short and easy. Taste bitter. With cold water, a bright yellow solution is formed immediately which fluoresces brilliant yellow in ultra-violet light of peak transmission 366 nm.

Microscopical: (Powder). Tabular cork cells. Sclerenchymatous elements present; small, yellow fibres with funnel-shaped pits and a narrow lumen, in strands two or three fibres wide, each fibre about 160 μm by 15 μm , few small pitted sclereids. Few isolated starch grains spherical, about 25 to 30 μm in diameter. Calcium oxalate absent. Few fragments of xylem vessels reticulately thickened or with small bordered pits, from incompletely removed wood.

U.S.D., 22nd Edn., p.227-8.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

Chromatography: Neugebauer & Brunner (1938) Pharm. Zentralhalle Dt. 79 161.

THERAPEUTICS

Action: Cholagogue. Antemetetic. Tonic to spleen causing splenic contractions. (Lascarato (1899) La. Grece medicale No. 2.)

Toxic to *Leishmania donovani*. (Ind. med. J. (1930) 65 683.)

Indications: Cholecystitis. Cholelithiasis. Jaundice. Leishmaniasis. Malaria.

Specific Indications: Gall-stones.

Combinations used: May be used with Chionanthus and/or Veronicastrum in gall-bladder disease.

Contra-indications: Avoid in diarrhoea and early pregnancy.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 25% alcohol.

Dose 2-3 ml. Tincture 1:10 in 60% alcohol. Dose 2-4 ml.

BERBERIS AQUIFOLIUM

SYNONYMS

Mountain Grape; Oregon Grape; Mahonia aquifolium.

DEFINITION

Berberis Aquifolium is the dried rhizome and root of *Berberis aquifolium* L. (Fam. Berberidaceae), a trailing shrub indigenous to the Rocky Mountain region of Nebraska and British Columbia. It contains alkaloids, berberine, oxyacanthine and berbamine.

DESCRIPTION

Macroscopical: Consists of long cylindrical pieces of rhizome occasionally branched or knotty, 1-4 cm in diameter, externally yellow-brown, wrinkled longitudinally; root branches and rootlets hard and tough. Internal surface, bark dark brown 1 mm thick, xylem lemon-yellow, distinctly radiate with narrow medullary rays, pith bright yellow 2 mm diameter. Odour slight; taste bitter.

Microscopical: Yellow-brown powder consisting of medullary ray cells containing starch grains 3-20 μm in diameter, 2-3 compound; pitted and reticulate vessels, thick walled lignified xylem fibres, fragments of parenchyma containing a yellow amorphous substance, fragments of thick-walled pith parenchyma.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

Thin Layer and Paper Chromatography: Pfeifer, S. (1966). J. Chromatog., 24, 364.

THERAPEUTICS

Action: Anti-catarrhal. Antemetetic. Mild cholagogue and laxative.

Indications: Cutaneous disease. Gastritis. Leucorrhoea.

Specific Indications: Psoriasis. Eczema. Catarrhal gastritis with cholecystitis.

Combinations used: May be combined with Lappa Root or Rumex Crispus in skin conditions. In stomach and gall-bladder disease it may be used with Chamaemelum, Acorus and Veronicastrum.

Preparations and Dosage: (thrice daily)

Dried root. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

BETONICA

SYNONYMS

Betony; Stachys betonica.

DEFINITION

Betonica consists of the dried aerial parts of *Betonica officinalis* L. (Fam. Labiatae) gathered during the flowering period. The plant is a native British herb, up to 60 cm tall, upright, with a basal rosette of oblong, cordate, coarsely crenate, long-petioled leaves, bearing a spike of bright, red-purple, flowers with spiny calyx teeth.

Betonica contains alkaloids, including betonicine and stachydrine.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments rough, with serrate margins, of various shades of green. Many flower calyces, conical, with five spiny teeth, up to 4 mm long, dark violet-green. Mainly stem pieces, pithy, four-sided, hairy, finely striated longitudinally, pale green to violet. Taste slightly bitter.

Microscopical: Covering trichomes of the leaf up to 1 mm long, uniseriate, usually of 3 cells, thick-walled, straight, finely warted, pointed. Glandular trichomes of the labiate type, with unicellular stalks and round heads of 8 cells. Leaf epidermis with slightly sinuous anticlinal walls, those of the upper surface being slightly beaded. Stomata diacytic. Calcium oxalate absent. Pollen grains spherical, with a finely granular exine and 3 furrows, about 40 μm in diameter.

Greenish and Collin, p.56-7.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Sedative. Bitter.

Indications: Headache. Vertigo. Anxiety states. Hysteria. Neuralgia.

Specific Indications: Headache in neurasthenia.

Combinations used: May be used with *Scutellaria* for nervous headache.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

BIDENS

SYNONYM

Bur-Marigold.

DEFINITION

Bidens consists of the dried aerial parts of *Bidens tripartita* L. (Fam. Compositae), gathered during the flowering period. The plant is a native British herb, up to 60 cm tall, upright, much-branched, with opposite, lanceolate, coarsely serrate leaves composed of three leaflets, bearing small, solitary, sub-erect heads of compositous flowers composed entirely of yellow disc florets.

Bidens contains a volatile oil and astringent principles.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments crumpled, green, some showing serrated margin. Few small flowerheads of bristly, yellow tubular florets separated by thin, membranous bracts, all surrounded by dark purple involucre bracts. Stem pieces hollow or pithy, wrinkled, dark green.

Microscopical: Covering trichomes of the leaf, uniseriate, of about 6 short cells, pointed, wide at the base, warty. Leaf epidermis with sinuous anticlinal walls, crossed by fine cuticle striations. Stomata, anomocytic. Florets with two opposing barbed blunt ended pappus spines from the top of the ovary, and as long as the tubular corolla, consisting of a multicellular column of cells about 200 μm in diameter including some vascular tissue, with many thorn-like unicellular covering trichomes about 350 μm long directed towards the pappus base. Pollen grains compositous, spherical, with a spiny exine and three pores, about 30 μm in diameter.

THERAPEUTICS

Action: Antihaemorrhagic. Astringent.

Indications: Haematuria. Metrorrhagia. Peptic ulceration. Ulcerative colitis.

Specific Indications: Essential haematuria.

Combinations used: May be used with Symphytum or Agrimonia according to indications. Acorus or Zingiber also combine well in treatment of the digestive system.

Preparations and Dosage: (thrice daily)

Dried plant. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 1.5-3.0 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

BRYONIA

SYNONYMS

White Bryony; Wild Vine.

DEFINITION

Bryonia consists of the sliced dried root of *Bryonia alba* L. or of *Bryonia dioica* Jacquin (Fam. Cucurbitaceae). The plants are dioecious, perennial, climbing vines indigenous to central and southern Europe. *Bryonia alba* produces black berries, *Bryonia dioica*, red berries. The root is collected in summer or autumn. Bryonia contains glycosides, including a crystalline phytosterol glucoside bryonol, and bryonin, an alkaloid, cucurbitacins, a small amount of volatile oil, fatty acids and tannin.

B.P.C. (1934), p.229.

DESCRIPTION

Macroscopical: Root slices; irregular pieces, 1.5-10 cm in diameter, 3-20 mm in thickness. Cork yellowish, longitudinally wrinkled, sometimes exfoliating to reveal phloem which consists of narrow phloem strands separated by broad medullary rays. Cut surfaces whitish; transversely cut pieces show radiate xylem in concentric zones. Odour slight, taste bitter and acrid.

Microscopical: Powder light yellowish brown. Abundant starch grains simple, or up to 6 compound, 5-35 μ m in diameter with cleft hilum. Cork cells yellowish, elongated, thin-walled, non-lignified. Vessels lignified, most reticulately thickened, some bordered pitted. Some secretory tissue present consisting of elongated cells with granular contents. Parenchyma non-lignified and lignified, calcium oxalate absent.

The powder gives a reddish brown then purplish brown colour with sulphuric acid.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Powerful cathartic and hydragogue. Emetic – (Large dose)
Expectorant. Diaphoretic. Vermifuge – (Small dose).

Topically: Rubefacient. Vesicatory.

Indications: Bronchitis. Pleurisy. Rheumatic diseases – (Small dose)..
Topically: Myalgia. Pleurodynia.

Specific Indications: Rheumatic pains, lumbago – in low dosage.

Combinations Used: Combines with Menyanthes, Filipendula and Apium in rheumatic conditions.

Preparations and Dosage: (thrice daily)

Dried root. Dose (small) 0.1-0.5 g or as decoction. Dose (large) 0.5-2 g.
Liquid Extract 1:1 in 25% alcohol. Dose 0.1-0.5 ml. Tincture. B.P.C. (1934).
Dose 0.06-0.6 ml.

Precautions: Large doses may precipitate menstruation or cause haemorrhoidal trouble. Avoid during pregnancy.

CALENDULA

SYNONYMS

Marigold; Mary-bud; Gold-bloom.

DEFINITION

Calendula consists of the dried ligulate florets of the common marigold, *Calendula officinalis* L. (Fam. Compositae). An annual herb indigenous to Southern Europe and widely cultivated. Flowers are collected when fully open and dried. Calendula contains a volatile oil, saponins, a yellow resin calendulin and a bitter principle.

B.P.C. (1923), p.251. Merck Index, 7th Edn., p.199.

DESCRIPTION OF FLOWERS

Macroscopical: Florets, usually without the ovary: corolla bright yellow or orange 15-25 mm long and 3 mm broad, one to three toothed with four or five veins, margin nearly entire, the short hairy tube often enclosing the remains of a filiform style and bifid stigma; ovary oblong, 0.5 mm in length, pubescent. Odour slight and aromatic, taste saline and slightly bitter.

Microscopical: Bright yellow powder, consisting of floret fragments. Epidermal cells narrow, elongated with sinuous walls, irregular chromoplastids and some oil globules; pollen grains 40 μ m in diameter with 3 pores and a spinose exine, non-glandular hairs consisting of a double row of cells with 1-2 celled apex up to 900 μ m in length; calcium oxalate rosettes 2-6 μ m in diameter.

Total Ash: Not more than 9%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

Paper Chromatography: Netein, G., Mery, L. (1962), Bull. Trav. Soc. Pharm. Lyon. 6, 35.

THERAPEUTICS

Action: Spasmolytic. Mild Diaphoretic. Anti-inflammatory. Anti-haemorrhagic. Emmenagogue. Vulnerary. Styptic. Antiseptic.

Indications: Gastric and duodenal ulcer. Amenorrhoea. Dysmenorrhoea. Epistaxis. Topically – Crural Ulcer. Varicose Veins. Haemorrhoids. Anal Eczema. Proctitis. Lymphadenoma. Inflamed cutaneous lesions. Conjunctivitis, as eye lotion.

Specific Indications: Enlarged or inflamed lymphatic nodes. Sebaceous cysts. Duodenal Ulcer. Inflammatory skin lesions, acute or chronic.

Combinations used: Combines with Geranium Herb in duodenal ulcer. May be used with Ulmus and Chondrus as a lotion for cuts, bruises, burns or scalds. Combines well with Distilled Water of Witch hazel as a lotion in varicose veins; or with Hydrastis and Myrrh as an antiseptic application.

Preparations and Dosage: (thrice daily)

Dried florets. Dose 1-4 g or by infusion. Liquid Extract 1:1 in 40% alcohol. dose 0.5-1 ml. Tincture (B.P.C. 1934) 1:5 in 90% alcohol. Dose 0.3-1.2 ml.

CALLUNA

SYNONYMS

Heather flowers; Ling flowers.

DEFINITION

Calluna consists of the flowers and leaves from the inflorescence of *Calluna vulgaris* (L.) Hull (Fam. Ericaceae), a native evergreen shrub found on moors, bogs and in open woods, on acid soils. It contains flavone glycosides quercitrin and myricitrin, arbutin, 7% tannin and an alkaloid ericodin.

DESCRIPTION

Macroscopical: Flowers whole, detached, conical to almost spherical, 1.5-3 mm in diameter with two pairs of small, ovate, leafy bracteoles at the base and sometimes attached to a very short, leafy pedicel. Calyx deeply 4-lobed, large, purple, imbricate and enclosing the corolla. Petals 4, purple, cleft to the base, alternating with, and smaller than, the calyx lobes. Anthers 8, awned; ovary 4-celled with a single style and stigma. Leafy shoots up to about 10 mm long, bearing numerous very small, linear leaves in opposite pairs forming 4 densely crowded vertical rows; leaves 1-2 mm long, sessile, with 2 short projections at the base, margins revolute giving a trigonous structure. Odour slight; taste slightly astringent.

Microscopical: Powder grey-green. Calyx fragments very abundant, showing epidermis composed of thin-walled, elongated cells with thicker walled, lignified and pitted cells at the base. Leaf fragments with wavy walled, slightly elongated epidermal cells with beaded thickening, striated cuticle and anomocytic stomata; covering trichomes long, thin, tortuous, unicellular with warty walls, glandular trichomes with a uniseriate stalk composed of 3-8 cells and a unicellular head; mesophyll containing calcium oxalate cluster crystals 35-80 μm in diameter. Corolla fragments showing elongated epidermal cells with slightly thickened and pitted walls. Bracteoles similar to the leaves with abundant covering trichomes and anomocytic stomata. Fragments of the anther reddish brown, fibrous layer composed of thick walled, pitted cells; epidermal cells of the filament with well marked projections. Pollen grains about 50 μm in diameter, 3-lobed with a slightly warty exine. Brownish fragments of the stigma with elongated papillae. Fragments of ovary and ovules infrequent.

THERAPEUTICS

Action: Diuretic. Urinary antimicrobial. Cholagogue. Anti-rheumatic. Vulnerary.

Indications: Cystitis. Lithuria. Gout. Simple rheumatism.
Topically: Wounds.

Specific Indications: Urinary infection.

Combinations Used: May be combined with *Arctostaphylos* and *Agathosma* in cystitis; with *Cimicifuga* and *Apium* in rheumatism.

Preparations and Dosage: (thrice daily)

Dried flowers and leaves. Dose 1-2 g or as infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

CAPSELLA

SYNONYM

Shepherd's Purse.

DEFINITION

Capsella is the dried herb *Capsella bursa-pastoris* (L.) Medic (Fam. Cruciferae), an annual or biennial growing up to 40 cm high, indigenous to Europe and West Africa. *Capsella* contains luteolin 7-rutinoside and quercetin 3-rutinoside.

DESCRIPTION

Macroscopical: Basal leaves oblanceolate, narrowed into a stalk, varying from deeply pinnatifid to entire, stem leaves variable in shape and lobing but may clasp the stem with basal acute auricles. Seed pods triangular, pale yellow-green 3-4 mm long and 2-3 mm wide at the widest point, seeds 0.5-1 mm long, pale brown. Pieces of stem cut 0.5-1 cm long, 1-2 mm wide, pale green, longitudinally striated. Odour very faintly aromatic; taste pungent.

Microscopical: Pale green powder, leaf epidermal cells deeply wavy-walled, stomata frequent on the upper surface, anisocytic; trichomes of two types, long multicellular uniseriate covering trichomes and smaller stellate and candelabrum trichomes arising from a unicellular base. Densely packed palisade cells visible below upper epidermis, calcium oxalate absent. Fragments of stem abundant, bundles of slightly lignified narrow fibres with a thin wall and wide lumen, narrow spirally thickened vessels. Seed pod fragments, epidermis of wavy-walled cells with frequent anisocytic stomata, trichomes absent, endodermis of rows of narrow elongated cells.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2.5%.

Paper Chromatography: Ergakora, Z.P. (1962) Tr. Mosk. Med. Inst., 18, 146.

THERAPEUTICS

Action: Anti-haemorrhagic. Urinary antiseptic.

Indications: Menorrhagia. Haematemesis. Haematuria. Diarrhoea. Acute catarrhal cystitis.

Specific Indication: Uterine haemorrhage.

Combinations used: May be combined with Trillium and Hydrastis in menorrhagia or metrorrhagia. Used with Agathosma in cystitis.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

CAPSICUM

SYNONYMS

African Chillies; Cayenne.

DEFINITION

Capsicum consists of the dried ripe fruits of *Capsicum minimum* Roxb. (Fam. Solanaceae), a small erect shrub indigenous to tropical America and cultivated in South America and Africa. Capsicum contains a crystalline pungent principle capsaicin, traces of a liquid alkaloid, red colouring matter and a fatty oil.

B.P.C. (1973), p.72, Martindale, 26th Edn., p.1235.

DESCRIPTION OF FRUITS

Macroscopical: Fruits dull orange-red in colour, oblong-conical in shape, obtuse at the apex; two-celled varying from 12-25 mm in length and up to 7 mm wide at the centre. Sometimes attached to a five toothed, inferior calyx and a straight slender pedicel up to 2-3 cm long. Pericarp shrivelled, translucent and leathery enclosing 10-20 flat reniform seeds 2-4 mm long. Odour characteristic and powerful; taste extremely pungent .

Microscopical: Brown-red powder, outer epidermal cells of pericarp in rows of 5 to 7, walls straight and uniformly thickened with a striated cuticle; droplets of red oil in pericarp parenchymatous cells, characteristic inner epidermis with groups of sclerenchymatous cells separated by thin-walled parenchyma. Seed epidermis of large sinuous cells, thin outer walls and thickened and pitted radial and inner walls.

Jackson & Snowden, p.112.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Thin Layer Chromatography: Hänsel, R., Leuckert, C. and Schulz, G. (1960). Z. Naturforsch., 21(b), 530.

THERAPEUTICS

Action: Stimulant. Spasmolytic. Carminative. Diaphoretic. Externally – Counter-irritant. Antiseptic. Rubefacient.

Indications: Flatulent dyspepsia in absence of inflammation. Colic. Insufficiency of peripheral circulation. Chronic laryngitis, as a gargle. External use – neuralgia: rheumatic pains: unbroken chilblains.

Specific Indications: Atony of the digestive organs especially in debility of senescence. As an adjuvant in the treatment of the debilitated. Topically – lumbago (as a lotion): unbroken chilblains (as lotion or ointment).

Combinations used: May be combined with *Althaea* and *Filipendula* for flatulence or spasm of the digestive tract. It combines well with *Myrrh* as a gargle or an antiseptic for external use.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 30-120 mg. Tincture (B.P.C. 1968) 1:20 in 60% alcohol. Dose 0.3-1 ml. Strong Tincture (B.P.C. 1934) 1:3 in 60% alcohol. Dose 0.06-0.2 ml.

CARUM

SYNONYM

Caraway; Caraway fruits; *Fructus Carvi*.

DEFINITION

Carum consists of the dried ripe fruits of *Carum carvi* L. (Fam. Umbelliferae), an erect biennial herb distributed over Central and Northern Europe and also found in Britain, cultivated principally in Holland. The fruits are harvested in August of the second year. *Carum* contains 2.5 to 6.0% of volatile oil which contains limonene and about 55% of carvone. The fruits also yield a fixed oil and about 20% of protein.

B.P.C. (1973), p. 78. Martindale 27th Edn., p. 1014.

DESCRIPTION

Macroscopical: Cremocarps, laterally compressed, oblong-ellipsoidal; mericarps, araccate and taper towards the base and apex to which half of the stylopod is attached, about 4-7 mm long and 1 mm broad at the widest point. Outer surface glabrous, brown, five primary ridges are yellow in colour. Transverse section of mericarp a regular pentagon, commissural surface slightly longer than the others; six vittae and five primary ridges in each mericarp, small schizogenous secretion canal in each rib joint above the vascular bundle. Odour agreeable; taste aromatic.

Microscopical: Fawn-brown powder. Epidermal cells polygonal, thick outer walls, cuticle striated, stomata anomocytic. Brown fragments of vittae, cells polygonal in surface view, thin-walled. Vascular strands, narrow annular thickened vessels, sclerenchyma fibres and rectangular pitted sclereids. Thick-walled endosperm cells containing oil and numerous aleurone grains up to 10 μm in diameter, containing minute rosette crystals of calcium oxalate. Jackson & Snowdon, p. 124.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 2%.

Thin-Layer Chromatography: Betts, T.J. (1964) *J. Pharm. Pharmacol. Suppl.*, 16, 131.

THERAPEUTICS

Action: Carminative. Spasmolytic. Expectorant. Emmenagogue. Astringent. Antimicrobial.

Indications: Flatulent dyspepsia. Anorexia. Intestinal colic. Diarrhoea. Bronchitis. Dysmenorrhoea. Laryngitis, as gargle.

Specific Indication: Flatulent colic in children.

Combinations used: Combines with Althaea Root, Chamaemelum and Acorus in digestive disorders with flatulence and colic. Used with Agrimonia, Myrica and Quercus in diarrhoea: with Marrubium, Lobelia, Euphorbia and Grindelia in bronchitis and bronchitic asthma.

Preparations and Dosage: (thrice daily)

Powdered fruits. Dose 0.5-2.0 g or by infusion. Tincture 1 in 5 in 45% alcohol. Dose 0.5-4 ml. Oil. B.P.C. (1973). Dose 0.05-0.2 ml.

Storage: Keep in airtight containers protected from light and heat.

CASSIA FRUIT

SYNONYMS

Senna Pods; Sennae fructus.

DEFINITION

Cassia Fruit consists of the dried fruits of *Cassia senna* L. (*C. acutifolia* Delile) known as Alexandrian Senna and *C. angustifolia* Vahl (Fam. Leguminosae) known as Tinnevely senna, cultivated in the Sudan and Southern India. The constituents of the dried fruits are similar to those of Cassia Leaf. Tinnevely pods contain 1.2-2.5% of hydroxyanthraquinone calculated as sennoside B and Alexandrian pods contain 2.5-4.5% also calculated as sennoside B. European Pharmacopoeia (1969), p.361. B.P.C. (1973), p.437. Martindale 27th Edn., p. 1342.

DESCRIPTION

Macroscopical: *Cassia senna*. Flattened reniform pods, brown to yellow-brown at the edges, dark brown in the central area, 40-50 mm long and about 20 mm wide; pods terminate at one end with a styler point and at the other with a short stalk; 6-7 obovate seeds in each fruit, flattened, green to brown with a continuous network of prominent ridges on the testa.

Cassia angustifolia. Flattened reniform pods, brown-yellow at the edges, dark-brown in the central area, 30-60 mm long and up to 18 mm wide; pods terminate at one end with a styler point and at the other end with a short stalk; 5-8 obovate seeds in each fruit, flattened, green to brown with transverse ridges on the testa. Odour slight; taste slight.

Microscopical: Brown powder. Pericarp fragments, epidermal cells isodimetric with thick outer walls, occasional stomata paracytic and anomocytic; trichomes, unicellular and warty. Endocarp fragments, fibres 5-7 μ m wide in layers of 2-4 crossing obliquely; mesocarp, parenchyma cells containing crystals of calcium oxalate 7-10 μ m in length. Vascular strands each surrounded by a crystal sheath of calcium oxalate crystals. Seed coat, epidermis of small cells, thick cuticle, mucilaginous; hypodermis, sclereids and an inner layer of thick-walled cells, giving a horse-shoe shaped outline to the intercellular spaces; endosperm, polyhedral cells, thick mucilaginous walls; embryo, thin-walled parenchyma.

Note: Cassia fruit complies with the test for identification, thin-layer chromatographic test and chemical assay of the European Pharmacopoeia (1969), pp. 361-366.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

THERAPEUTICS

Action: Cathartic.

Indication: Constipation.

Combinations used: May be combined with Glycyrrhiza, Zingiber, Elettaria, Foeniculum vulgare to increase palatability and decrease griping.

Preparations and Dosage: Dried pods. Alexandrian Senna 3-6 pods steeped in 150 mls warm water for 6-12 hours. Tinnevely Senna. 4-12 pods, as above. Liquid Extract B.P.C. (1973). Dose 0.5-2 ml three times a day.

Incompatibilities: Incompatible with cinchona, heavy metal salts, mineral acids, carbonates, lime water.

CASSIA LEAF

SYNONYMS

Senna Leaf; Sennae Folium.

DEFINITION

Cassia Leaf consists of the dried leaflets of the paripinnate leaves of *Cassia senna* L. (*C. acutifolia* Delile) known as Alexandrian Senna and *C. angustifolia* Vahl (Fam. Leguminosae) known as Tinnevely Senna, cultivated in the Sudan and Southern India. Cassia Leaf contains sennosides A and B (glucosides of stereoisomers of rhein dianthrone). The aglycone of sennoside A is dextro-rotary, whilst that of sennoside B is the meso-form. Smaller quantities of sennosides C and D (glucosides of the heterodianthrone of rhein and aloe-emodin), rhein, anthrone 8-glucoside, rhein 8-glucoside, rhein 8-diglucoside, aloe-emodin 8 glucoside, aloe-emodin anthrone diglucoside, rhein, aloe-emodin, kaempferol and isorhamnetin are also present. Cassia Leaf contains 2-3% of hydroxy-anthraquinone calculated as sennoside B.

European Pharmacopoeia (1969), p. 358; B.P.C. (1973), p. 438; Martindale 27th Edn., p. 1343.

DESCRIPTION

Macroscopical: *Cassia senna*. Grey-green fragile leaflets, lanceolate to ovate-lanceolate, mucronate, asymmetrical at the base, 20-40 mm long and 5-15 mm wide; lamina slightly undulate and pubescent, venation pinnate, lateral veins leaving the midrib at an angle of 60° and anastomosing near the margin.

Cassia angustifolia. Yellow-green fragile leaflets, elongated and lanceolate, slightly asymmetrical at the base, 30-50 mm long and 7-20 mm wide at the central point. Surfaces frequently marked by oblique or transverse lines. Odour slight but characteristic; taste mucilaginous then bitter.

Microscopical: Light-green to green-yellow powder. Upper and lower epidermis of straight-walled polyhedral cells, many containing mucilage in the inner half, which stains with ruthenium-red solution; stomata paracytic; trichomes conical, unicellular up to 250 µm in length, somewhat curved with a thick warty wall; mesophyll isobilateral with one row of palisade cells beneath each epidermis. Elongated fibres of the mid-rib-bundle caps with an outer sheath of parenchyma cells often containing a single prism of calcium oxalate; cluster crystals of calcium oxalate in some mesophyll cells.

Jackson & Snowdon, p. 74.

Total Ash: Not more than 11%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Content of Stalks: Not more than 2%.

Water Soluble Extractive: Tinnevely 20-35%. Alexandria 30-40%.

Note: Cassia Leaf complies with the test for identification, thin-layer chromatographic test and chemical assay of the European Pharmacopoeia (1969), pp. 358-361.

THERAPEUTICS

Action: Cathartic, stronger than the fruits.

Indication: Constipation.

Combinations used: As Cassia Fruit.

Preparations and Dosage:

Dried leaflets. Dose 0.5-2 g. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml three times daily.

Incompatibility: As Cassia Fruit.

CASTANEA

SYNONYMS

Sweet Chestnut; *Castanea vesca*; *Fagus castanea*; *Castanea vulgaris* Lam.

DEFINITION

Castanea consists of the dried leaves of *Castanea sativa* Mill. (Fam. Fagaceae), a large deciduous tree indigenous to Europe. The leaves are leathery, narrow and glossy, up to about 20 cm long. The flowers occur as male and female catkins, the fruit as a spiny capsule enclosing the shiny brown nuts. Castanea contains tannins, plastoquinones and organic acids.

DESCRIPTION

Macroscopical: Broken leaf pieces up to about 1 cm in maximum dimension. Margin serrate to dentate, main veins conspicuous on the lower surface, subsidiary venation reticulate. Upper surface brownish green with scattered hairs, lower surface paler and more densely pubescent, especially on younger leaves near the main veins. Occasional pieces of woody stem, reddish brown and with pale, longitudinally elongated lenticels. Odour slight; taste astringent.

Microscopical: Powder brown-green. Fragments of epidermis, upper surface of straight walled cells, occasionally slightly lignified, lower surface with wavy walled cells and numerous anomocytic stomata; covering and glandular trichomes on both surfaces; covering trichomes of two types, some long, conical, unicellular with thick walls which are frequently warty and may also show spiral markings appearing as crossed lines, others stellate, composed of several elongated, conical cells joined at the base and attached to the epidermis by a short stalk, each cell with a moderately thickened wall; both types may be slightly lignified. Glandular trichomes most frequent on the veins, small, unicellular or with a short, uniseriate stalk and a multicellular head. Cluster crystals of calcium oxalate, up to 50 μ m in diameter, in the underlying mesophyll. Groups of fibres with moderately thickened, lignified walls. Parenchyma containing cluster crystals of calcium oxalate and occasional vessels with bordered pits from the stem fragments.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 5%.

THERAPEUTICS

Action: Astringent, Antitussive. Antirheumatic.

Indications: Pertussis. Tracheitis. Bronchial catarrh. Diarrhoea. Muscular rheumatism. Lumbago. Generalised fibrositis. Pharyngitis – gargle.

Specific Indication: Paroxysmal cough.

Combinations Used: May be combined with Grindelia, Marrubium, Cephælis and Prunus in pertussis: with Geranium and Alchemilla in infantile diarrhoea: with Apium, Cimicifuga, Menyanthes and Filipendula in muscular rheumatism and generalised fibrösitis.

Preparations and Dosage: (thrice daily)

Dried leaf, as infusion. Dose 2-4 g. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

CATECHU BLACK

SYNONYMS

Black Catechu; Acacia Catechu; Cutch.

DEFINITION

Catechu, Black is the dried extract prepared from the heart wood of *Acacia catechu* Willd. (Fam. Leguminosae), a tree indigenous to Eastern India and Burma. The bark and sapwood are stripped from the felled tree and the heart wood cut into pieces and boiled with water. The decoction is evaporated to a syrup and allowed to cool in moulds. The resulting dried mass is broken into irregular pieces. Catechu, Black contains 20-35% of catechutannic acid, 2-10% of acacatechin, quercetin and catechu-red.

B.P.C. (1949), p. 225. Martindale 27th Edn., p. 217.

DESCRIPTION

Irregular dark-brown to black pieces of broken dried extract. Externally rough and dull, occasionally glossy on one or more broken surface. Fracture short and brittle but soft internally, fractured surface dark-brown glossy and porous. Odourless; taste bitter at first then becoming sweet and astringent. Partly soluble in water, insoluble portion under microscopical examination consisting of numerous minute crystals; soluble in boiling water but crystallises on cooling.

Test for Identity: A 1% aqueous solution produces a green colour with 0.1% ferric chloride solution, changing to purple with the addition of 5% sodium hydroxide solution. Catechu, Black gives a negative fluorescein test in contrast to gambia.

Total Ash: Not more than 8%.

Alcohol Soluble Extractive: Not less than 60% (in 90% alcohol).

THERAPEUTICS

Action: Antiseptic. Astringent.

Indications: Chronic diarrhoea. Dysentery. Mucous colitis. Leucorrhoea (as a douche). Gingivitis. Stomatitis. Pharyngitis (as a mouth wash or gargle).

Specific Indication: Chronic diarrhoea with colitis.

Combination used: It may be combined with Acorus, Mentha Piperita, Filipendula, Agrimonia and Quercus in lower bowel conditions: with Commiphora Resin and Hamamelis as a gargle or wash for pharyngitis, tonsillitis or gingivitis.

Preparation and Dosage: (thrice daily)

Dried extract. Dose 0.3-2 g or by infusion. Tincture 1:5 in 45% alcohol. Dose 2.5-5 ml.

Incompatible with alkalies, lime water, metallic salts and gelatin.

CAULOPHYLLUM

SYNONYMS

Blue Cohosh; Squaw Root; Papoose Root.

DEFINITION

Caulophyllum consists of the dried rhizomes and roots of *Caulophyllum thalictroides* (L.) Mich. (Fam. Berberidaceae). A herbaceous plant indigenous to the Eastern part of the United States and Canada. Caulophyllum contains alkaloids including magnoflorine, laburnine, cytisine, caulophylline and caulosapogenin.

B.P.C. (1934), p. 229. Martindale 25th Edn., p. 1513.

DESCRIPTION

Macropscopical: Consisting of cut pieces of rhizome with numerous long wiry matted roots. Rhizome pieces 1-3 cm long, 0.5-1.0 cm wide. Externally grey-brown, slightly annulate from leaf scars, the upper surface with depressed cup-shaped scars; under surface and lateral portions with numerous branching roots. Fracture short, surface with thin bark, numerous small xylem wedges, broad medullary rays and a large pith. Odour slight, sternutatory; taste bitter and acrid.

Microscopical: Powder light-brown, starch grains numerous 3-16 μ m in diameter, spheroidal in shape, fragments of cork with yellow-brown walls, pitted vessels in groups, few heavily lignified tracheids with bordered pits, fragments of parenchymatous tissue containing starch.

Thin-Layer Chromatography Identity Test: Shake 1 g powdered Caulophyllum with 10 ml dilute sulphuric acid for several minutes, filter, make alkaline with solution of ammonia and extract with 10 ml chloroform. Separate the chloroform layer, evaporate to a low bulk (about 1 ml) and apply to a T-L.C layer of silica gel 25 μ m thick activated at 110°C for 30 minutes. Develop to 10 mm with acetone: methanol (3:2). Spray with Dragendorff's reagent. Three orange-brown spots should be seen of which the most prominent has a hR_f value of about 12-15 and a Rel. R_f value (quinine as standard) of 0.4.

Acid Insoluble Ash: Not more than 4%.

THERAPEUTICS

Action: Spasmolytic. Emmenagogue. Uterine tonic. Antirheumatic.

Indications: Amenorrhoea. Threatened miscarriage. False labour pains. Dysmenorrhoea. Rheumatic pains.

Specific Indications: Conditions associated with uterine atony.

Combinations used: Combines well in uterine weakness with Chamaelirium, Leonurus and Millefolium.

Preparations and Dosage: (thrice daily)

Dried rhizome and roots. Dose 0.3-1 g or by decoction. Liquid Extract 1:1 in 70% alcohol. Dose 0.5-1 ml.

Note: Only small doses are advisable during the first trimester of pregnancy.

CENTAURIUM

SYNONYMS

Centaury; *Erythraea centaurium* L; *Centaurea minor*.

DEFINITION

Centaurium is the dried flowering aerial parts of *Centaurium erythraea* Rafin. (Fam. Gentianaceae), an annual herb indigenous to Europe and naturalised in North America. The herb is gathered in June – August when in flower. Centaurium contains volatile oil, a bitter substance; a resin; erytaurin, a glycoside, and a tasteless crystalline substance which turns red on exposure to air.

Martindale 27th Edn., p. 254.

DESCRIPTION

Macroscopical: Stems, obscurely four-angled, or cylindrical and somewhat winged, from 20-30 cm in length, branched above; externally light green to brown, finely longitudinally striated; pith hollow. Leaves opposite, sessile, linear-oblong or elliptical from 2-3.5 cm in length and 2-10 mm in width; summit acute, margin entire, green-brown and glabrous. Flowers in dense terminal cymes, calyx tubular with long linear segments; corolla, salver-shaped, rose pink to light brown when dry, five stamens exserted from corolla tube, ovary unilocular, style filiform, fruit an ovoid two-valved capsule containing small reticulated seeds. Odour distinct; taste bitter.

Microscopical: Greenish-brown powder; stem fragments show a layer of epidermal cells with strongly thickened outer walls, a narrow cortex and phloem, xylem of a closed ring of lignified vessels, fibres and thick walled parenchymatous cells. Leaf upper epidermis having short papillae, walls strongly thickened and cuticle finely wrinkled; palisade of two rows of cells; lower epidermis bearing numerous stomata. Epidermal layer of the calyx consisting of thick-walled cells developed into short papillae with a small lumen. Pollen grains spheroidal, nearly smooth with three pores, 25-30 μ m in diameter.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Thin-Layer Chromatography: Atkinson, R. E., Curtis, R. F., (1965), Tetrahedron Letters 5, 297.

THERAPEUTICS

Action: Bitter. Aromatic. Stomachic.

Indications: Anorexia. Dyspepsia.

Specific Indications: Anorexia, especially in children with gastric or hepatic weakness.

Combinations used: May be given with Filipendula, Chamaemelum and Althaea in dyspepsia; with Chamaemelum and Lappa Root in anorexia nervosa; with Berberis and Rumex Crispus in jaundice.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

CENTELLA

SYNONYMS

Hydrocotyle asiatica; Indian Pennywort; Indian Water Navelwort.

DEFINITION

Centella is the dried aerial parts of *Centella asiatica* (L.) Urban (Fam. Umbelliferae), a small herbaceous plant indigenous to India and Pakistan, growing at an altitude of 600 metres above sea level in damp areas. Centella contains vallerin, a bitter principle, and a mixture of triterpenoid glycosides, the most abundant of which is asiaticoside ($C_{54}H_{88}O_{23}$) which on hydrolysis produces asiatic acid, glucose and rhamnose. It also contains traces of an alkaloid, volatile oil and pectin.

Martindale 27th Edn., p. 441.

DESCRIPTION

Macroscopical: A compressed mass consisting of stem, leaves and fruits. Stems 0.1-0.5 mm wide, long twisted and flattened. Leaves grey-green, up to 2 cm wide at the widest point and 1 cm long, but normally smaller, cordate, obtuse, almost semi-circular apex, crenate margin, petiole long narrow and flattened. Fruits in umbels of two to four bicarpellate schizocarps, pale green to brown, flattened, wrinkled, 2 mm long and 3 mm wide, longitudinally ridged with horizontal connecting ridges.

Microscopical: Grey-green powder; leaf fragments with an uneven cuticle, polygonal epidermal cells and frequent paracytic stomata; trichomes long, very narrow and often twisted, two branches arising from a common base, occasional multicellular uiseriate trichomes. Stem fragments, consisting of bundles of narrow septate fibres. Fruits, epidermis of polygonal cells, trichomes similar to the leaves, sheets of elongated parquetry layer cells, bundles of narrow annular vessels and parenchymatous cells containing single large prisms of calcium oxalate. Vittae absent.

THERAPEUTICS

Action: Mild diuretic. Antirheumatic. Dermatological agent. Peripheral vasodilator.

Topically: Vulnerary.

Indications: 'Rheumatic' condition. Cutaneous affections.

Topically: Indolent Wounds. Leprous Ulcers. Cicatrisation after surgery.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 0.6 g or by infusion.

Note:

1. Centella has been used in India for the treatment of leprosy ulcers (Dr. C. D. de Granpré 1888 quoted in Pharmacographia Indica 2, 107ff. See also Languillon, J. (1959), & (1960), – quoted in Martindale 26, p. 560, and Nebout M. (1974), quoted in Martindale 27, p. 441).
2. Centella may produce photosensitisation in tropical areas. Chopra, R. N., Chopra, I. C., Handa, K. L., Karpur, L. B. (1958), Indigenous Drugs of India, 2nd Edn., pub. U. N. Dhur and Sons Ltd. Calcutta p. 554 et seq.

CEPHAËLIS

SYNONYMS

Ipecacuanha Root; Ipecac; Ipecacuanhae Radix, Uragoga ipecacuanha.

DEFINITION

Cephaëlis is the dried root or rhizome and root of *Cephaëlis ipecacuanha* (Brot.) A. Rich. (Fam. Rubiaceae), known as Matto Grosso, Minas, Brazilian or Rio ipecacuanha; or *C. acuminata* Karsten, known as Cartegena, Costa Rica, Nicaragua or Panama ipecacuanha. The former is cultivated in Brazil and the latter in Colombia and Central America. Cephaëlis contains the isoquinoline alkaloids emetine, cephaëline, psychotrine, methylpsychotrine and emetamine, together with ipecacuanhic acid, ipecacuanhin, a saponin and starch. Cephaëlis contains not less than 2% of total alkaloids calculated as emetine $C_{29}H_{40}N_2O_4$ with reference to the drug dried at 100-105°C.

B.P.C. (1973), p. 249. European Pharmacopoeia (1969), I, p. 307.

DESCRIPTION

Macroscopical: *Cephaëlis ipecacuanha* root, tortuous, slender pieces from 5-15 cm long and 6 mm wide; externally dark-brown to brick-red, exhibiting annulations from 1-2 mm thick with rounded edges; fracture short in the bark but splintering in the xylem. Transverse section exhibits a thick starchy bark and a dense, narrow xylem. Rhizome pieces narrower and showing a central pith about one-sixth of the diameter of the rhizome. *C. acuminata* may be distinguished by its larger size, up to 9-10 mm wide, and by the absence of annulations which are replaced by transverse ridges only partly encircling the root. Odour faint; taste bitter.

Microscopical: Light grey-brown powder; *C. ipecacuanha* root, starch grains numerous, compound, from 2-7, granules oval, rounded or polyhedral, up to 15 μ m in diameter; thin-walled parenchyma cells often filled with starch, occasional idioblasts containing raphides of calcium oxalate 30-80 μ m long. Fibres of medullary rays long, thin-walled and septate; xylem tracheids with lateral perforations and bordered pits, lignified xylem parenchyma. Rhizome exhibits thick-walled phloem sclereids. *C. acuminata* may be distinguished by means of the starch grains which measure up to 22 μ m.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 1%.

Water Soluble Extractive: Not less than 25%.

Cephaelis complies with the identification test, chromatographic test, and assay of the European Pharmacopoeia, (1969), I, pp. 308-310.

THERAPEUTICS

Action: Expectorant. Diaphoretic. Emetic (large doses). Antiprotozoal.

Specific Indications: Bronchitis. Pertussis. Laryngismus stridulus. Amoebic dysentery.

Combinations used: May be used with Marribium, Tussilago and Grindelia in bronchitis and pertussis: with Geranium, Echinacea, Acorus and Rubus in amoebic dysentery, by mouth and by rectal injection.

Preparations and Dosage:

Dried rhizome and roots. Dose 25-100 mg. Liquid Extract BP. (1973). Dose 0.025-0.1 ml. Emetic dose 0.5-2 ml.

Tincture BP. (1973). Dose 0.25-1 ml. Emetic Dose 5-20 ml.

Ipecac Syrup U.S.P. XIX. Usual dose 15 ml. May be repeated in 20 minutes if emesis does not occur. The dosage should be recovered by gastric lavage if emesis does not occur after the second dose. Usual dose range 10-30 ml. Usual paediatric dose, under 1 year of age, 5-10 ml.

Note: Copious fluids should be taken after the administration of an emetic dose.

Contra-indications: General debility and exhaustion, shock, cardiac disease.

CETRARIA

SYNONYMS

Iceland Moss.

DEFINITION

Cetraria consists of the entire dried plant of *Cetraria islandica* (L) Ach. (Fam. Parmeliaceae). The plant is a lichen growing in all northern countries and consists of dichotomously branching, more or less curled, fringed segments, 5 to 10 cm long and about 0.5 cm wide. Upper surface greenish-brown, under surface greyish.

Cetraria contains the complex carbohydrates lichenin (40%) and isolichenin (10%), a bitter acid fumaroprotocetraric acid and other organic acids.

Martindale, 25th Edn., p.80. B.P.C. (1934) p.307.

DESCRIPTION OF LICHEN

Macroscopical: Pieces of the dried foliaceous lichen about 6 cm long with numerous ascending branches arranged in an unevenly developed dichotomy. The branches are thin, about 5 mm wide and 0.5 mm thick and are fringed with minute projections. The lichen is opaque, harsh and springy to the touch, light brown above and greyish below with white depressed spots. Almost odourless; taste bitter and mucilaginous.

Microscopical: Powder pale brown; much pseudoparenchyma present and small intertwining branching hyphae. Parts of the tissue stain blue-black with iodine water although starch grains are absent.

Deryng, p.360. Flück *et al*, p.286.

Total Ash: Not more than 2%.

Foreign Organic Matter: Not more than 3%.

THERAPEUTICS

Action: Demulcent. Antemetic. Expectorant.

Indications: Gastritis. Dyspepsia. Vomiting. Cachexia. Respiratory catarrh, bronchitis.

Specific Indications: Cachexia with vomiting.

Combinations used: May be combined with Ballota for nausea or vomiting.

Preparations and Dosage: (thrice daily)

Dry lichen. Dose 1-2 g in decoction. Tincture 1:5 in 40% alcohol. Dose 1-1.5 ml.

CHAMAEIRIUM

SYNONYMS

False Unicorn Root; Helonias Root; Blazing Star Root.

DEFINITION

Chamaelirium consists of the dried rhizome and roots of *Chamaelirium luteum* L. A. Gray (Fam. Liliaceae). The plant is a native of North America. Chamaelirium contains saponins, including chamaelirin.

DESCRIPTION OF CUT ROOT

Macroscopical: Rounded, irregular pieces of the upright rhizome, up to 1.5 cm in diameter, with a grey-brown, closely annulated exterior, and a horny, grey-white interior marked on some pieces by the endodermis cylinder and by scattered fibro-vascular bundles. Very fine, wiry, pale buff roots emerging from the rhizome pieces and also free. Taste astringent at first, bitter later.

Microscopical: (Powder): Cork cells tabular, brown, lignified. Xylem vessels scattered in groups in a parenchymatous ground tissue, lignified, spiral or reticulately thickened or with finely bordered pits. Much starch present, very small single and compound grains, up to 5 μ m in diameter. Calcium oxalate present in numerous idioblasts containing fan-like bundles of needles up to 55 μ m long. Few schlerenchymatous elements present, slightly lignified thin-walled fibres near the vessels. Endodermis of a layer of highly lignified somewhat elongated cells.

U.S.A., 22nd Edn., p.528.

THERAPEUTICS

Action: Uterine tonic.

Indications: Amenorrhoea. Ovarian dysmenorrhoea. Leucorrhoea. Reported to be useful in vomiting of pregnancy and threatened miscarriage.

Specific Indications: Amenorrhoea.

Combinations used: Combines well with Trillium.

Side Effects: Very large doses may cause nausea and vomiting.

Preparations and Dosage: (thrice daily)

Dried rhizome and roots. 1-2 g or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 1-2 ml. Tincture 1:5 in 45% alcohol. Dose 2-5 ml.

CHAMAEMELUM

SYNONYMS

Anthemidis Flores; Chamomile flowers; Roman chamomile; Anthemis nobilis.

DEFINITION

Chamaemelum consists of the dried double or semi-double capitula of cultivated varieties of *Chamaemelum nobile* L. Fam. Compositae. The plant is a small perennial, indigenous to Britain, but also cultivated in Belgium, France and Hungary.

The principal constituent of Chamaemelum is a volatile oil, which forms 0.4 to 1.0% of the drug, the chief constituents of which have been identified as esters of angelic and tiglic acids, together with amyl and isobutyl alcohols. It also contains anthemol and a hydrocarbon anthemene. Other constituents of the drug are i-inositol, triacontane and apigenin. The dark coloured glycoside anthemic acid is responsible for the bitter taste of the drug.

Martindale 25th Edn., p.851. B.P.C. (1954) p.164. Merck Index, 7th Edn., p.229.

DESCRIPTION OF THE FLOWERS

Macroscopical: The dried capitula (flower heads) are hemispherical, 10-20 mm in diameter, and cream to pale buff in colour. A solid, conical-shaped receptacle bears an involucre of two or three rows of oblong bracts with membranous margins, almost hidden by the reflexed outer ligulate florets. The commercial capitula consist almost entirely of ligulate florets with a few (10-20) tubular florets near the apex of the receptacle. The ligulate florets are pistillate and exhibit four principal veins, two or three terminal teeth and many glandular trichomes. The tubular florets are typically hermaphrodite with a bifid stigma and an inferior ovary, frequently in double heads showing malformations such as the presence of three or four stigmas and irregularly enlarged corolla lobes. The ovary of the floret is covered with glandular trichomes, but devoid of pappus. The receptacle is conical, solid and covered with paleae. Odour strong and aromatic; taste bitter.

Microscopical: The powder is pale buff in colour. Abundant fragments of the corollas of the ligulate florets are present. The outer epidermis is composed of thin sinuous walled cells, with striated cuticles and numerous glandular trichomes. The inner epidermis consists of thin-walled polygonal cells with papillae appearing as a distinct circle in surface view. Also visible are fragments of the paleae, normally as one layer of thin-walled, longitudinally elongated cells, although in the central region these are exhibited as thick-walled lignified pitted sclereids. The involucre bracts are similar to the paleae, but fragments from the base show anomocytic stomata. Fragments of the styles and stigmas are common, the styles consisting of thin-walled cells containing small clusters of calcium oxalate. The apices of the stigmas are extended to form elongated papillae. Occasionally found are fragments of the fibrous layer of the anthers, consisting of large cells with beaded walls. The covering trichomes are abundant, often detached, and are uniseriate with a long striated apical cell and four to five small basal cells. The glandular trichomes have a short biseriate stalk of two to four cells and a biseriate head of two cells, covered with a raised cuticle. Occasional pollen grains are also to be found, which are spherical with three pores and a spiny exine.

Jackson & Snowden, p.82.

Total Ash: Not more than 7%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

Thin Layer Chromatography: R. Grab (1963) Dt. Apoth. Ztg., 103, 1424-5.

THERAPEUTICS

Action: Carminative. Antemetic. Spasmolytic. Sedative.

Indications: Dyspepsia. Nausea and vomiting. Anorexia. Vomiting of pregnancy. Dysmenorrhea.

Specific Indications: Flatulent dyspepsia associated with mental stress.

Combinations used: May be used with Althaea, Filipendula, and Symphytum in digestive disease. Humulus is a useful addition to allay pain and anxiety.

Preparations and Dosage: (thrice daily)

Dried flowerheads. Dose 1-4 g or by infusion. Liquid Extract 1:1 in 70% alcohol. Dose 1-4 ml.

CHELIDONIUM

SYNONYM

Greater Celandine.

DEFINITION

Chelidonium consists of the dried aerial parts of *Chelidonium majus* L. (Fam. Papaveraceae) gathered during the flowering period. The plant is a native British herb, up to 90 cm tall, upright, with deeply lobed, almost pinnate leaves, bearing four-petalled yellow flowers.

Chelidonium contains alkaloids, including chelidoniumine, in an orange coloured latex.

DESCRIPTION OF CUT HERB

Macroscopical: Mainly leaf fragments, almost glabrous, with the 2 surfaces different shades of green. Flowers with 2 readily removed membranous sepals, 4 yellow petals and numerous stamens. Stem pieces ribbed, hollow and thin walled, collapsed, olive green. Odour peculiar and irritating.

Microscopical: Very few covering trichomes, long, uniseriate of 5 to 20 cells, thin-walled. Leaf epidermis with sinuous anticlinal walls. Stomata anomocytic in the lower epidermis only. Calcium oxalate absent. Larger veins associated with dark brown, non-branching latex tubes. Pollen grains spherical, with a finely pitted exine and 3 furrows, about 35 μ m in diameter.

Deryng. p.200-1.

Total Ash: Not more than 15%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

Paper Chromatography: Jusiak (1966) Acta. Pol. Pharm. 23 247. Kaczmarek & Malek (1959) Planta med. 7 171. Bandelin & Malesh (1956) J. Am. pharm. Ass. 45 702.

THERAPEUTICS

Action: Spasmolytic. Cholagogue. Diuretic.

Indications: Cholecystitis.

Topically: The juice has been used in tinea, eczema, verrucae and malignant tumours of the skin. (U.S. Dispensatory 25 1623).

Specific Indications: Gall stones.

Combinations used: With Berberis and/or Taraxacum in gall-bladder disease.

Side Effects: No harmful effects from therapeutic doses have been established. Excessive dosage should be avoided.

Preparations and Dosage: (thrice daily)

Dried herb. 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 1-2 ml. Tincture 1:10 in 45% alcohol. Dose 2-4 ml.

CHELONE

SYNONYM

Balmomy.

DEFINITION

Chelone consists of the dried aerial parts of *Chelone glabra* L. (Fam. Scrophulariaceae) gathered during the flowering period. The plant is a native of North America.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments brittle, dull and dark, the two surfaces different shades of green, with veins forming raised linear edges on one side. Flower buds and fruits ovoid-conical about 5 mm long, covered by overlapping ovoid, thin, brittle, dull, dark green-brown sepals; the flowers containing the stamens embedded in a mass of fine, white filament hairs; the fruits containing a number of seeds, flat, thin, ovoid discs about 2 mm wide, with a dark centre surrounded by a buff wing. Stem pieces somewhat quadrangular, rounded, hollow, light to dark green, mostly less than 2 mm in diameter.

Microscopical: Covering trichomes of leaf unicellular or uniseriate of about 4 cells, thick-walled, heavily warted. Epidermal cells with anticlinal walls polygonal on the upper surface and sinuous on the lower surface, crossed by cuticle striations. Stomata anomocytic on the lower surface only. Calcium oxalate absent. Covering trichomes of flower unicellular, long and twisted, thin, finely warted. Pollen grains triangular spheroids with a finely granular exine and 3 furrows, 25 to 40 μm in diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Cholagogue. Antemetemetic. Antidepressant. Laxative.

Indications: Cholecystitis. Anorexia. Intestinal colic.

Specific Indications: Gall-stones with jaundice.

Combinations used: Combines with Juglans for constipation. Combines with Gentiana and Hydrastis for hepatic jaundice.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:10 in 45% alcohol. Dose 1-2 ml.

CHIONANTHUS

SYNONYMS

Fringe-tree Bark; Old Man's Beard.

DEFINITION

Chionanthus consists of the dried root bark of *Chionanthus virginicus* L. (Fam. Oleaceae). The plant is a native of North America.

Chionanthus contains phyllyrin, a lignan glycoside, and saponins.

DESCRIPTION OF CUT BARK

Macroscopical: Bark in flattened curves, hard, up to 5 mm thick, with a short, mealy fracture, the outer surface being rough grey-brown, the inner surface being rough pale to dark brown. Taste somewhat astringent, becoming bitter.

Microscopical: (Powder): Cork cells tabular, yellowish. Scattered thick-walled elongated sclereids up to 300 μm long, singly and in small groups. Some scattered starch grains, spherical to polygonal, single and slightly compound grains, 4 to 20 μm in diameter. Mainly parenchyma containing small birefringent needle crystals. Calcium oxalate absent.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Laxative. Cholagogue. Antemetic. Hepatic stimulant.

Indications: Hepatic disease. Cholecystitis. Duodenitis. Glycosuria of hepatic or alimentary origin. Splenic enlargement. Portal hypertension.

Specific Indications: Hepatic disease with icterus and glycosuria.

Combinations used: Used with Echinacea in Weil's disease and acute parenchymal disease of liver. Combines well with Berberis, Euonymus or Dioscorea.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 1-3 ml. Tincture 1:5 in 45% alcohol. Dose 2-3 ml.

CHONDRUS

SYNONYMS

Irish Moss; Carrageen.

DEFINITION

Chondrus consists of the dried bleached alga *Chondrus crispus* (L.) Stackh. (Fam. Gigartinaceae), a red alga collected along the North Western coast of Ireland, Brittany and Eastern United States of America. The alga is green to purple when fresh but is bleached by watering and exposing to the sun. Chondrus contains 55-80% of a mixture of polysaccharides consisting of carbohydrate etheral sulphate occurring as the sodium, potassium and calcium salts. On hydrolysis 31-33% of galactose and smaller amounts of glucose and fructuronic acid are produced. In addition the alga contains 10% of protein. B.P.C. (1959), p. 185. Martindale 27th Edn., p. 921.

DESCRIPTION

Macroscopical: Matted, yellow-brown translucent masses frequently coated with a white calcareous deposit, consisting of slender thalli from 5-25 cm long, subcylindrical at the base, flattened in the upper region, dichotomously branching, emarginate or deeply cleft at the tip. Thallus exhibits small oval patches of cystocarps or the places from which they have fallen. Odour slight and seaweed like; taste mucilaginous and saline.

Microscopical: The diagnostic features are small closely packed cells of the cortex 4-6 μ m long, with thickened and pitted cell walls arranged in 6-8 layers; medulla cells elongated 20-60 μ m long with thick pitted mucilaginous walls; cystocarps contain tetrads of groups of 4 spores, individual spores oval or rounded 18-35 μ m in diameter with rough surfaces exhibiting dome-shaped prominences.

Identification Test: Boil with water and allow to cool. The resultant jelly does not give a blue colour with solution of iodine.

Total Ash: Not more than 16%.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Demulcent. Nutritive, Antitussive. Emollient.

Indications: Convalescence. Cachexia. Dyspepsia. Gastritis. Bronchitis. Cystitis.

Topically: as lotion in chapped hands. Dermatitis.

Specific Indications: Atonic dyspepsia with nausea and heartburn. Convalescence as dietary supplement.

Combinations used: May be combined with Cinnamomum and Glycyrrhiza in bronchial catarrh; with Althaea Root and Ballota in dyspepsia.

Preparations and Dosage: (thrice daily)

Dried thallus. Dose 5-10 g or by infusion.

CIMICIFUGA

SYNONYMS

Black Cohosh; Black Snakeroot; *Macrotys actaeae*; *Actaeae Racemosae* Radix.

DEFINITION

Cimicifuga consists of the dried rhizome and roots of *Cimicifuga racemosa* Nutt. (Fam. Ranunculaceae), a perennial herb indigenous to Canada and the United States of America. It is collected in the autumn. *Cimicifuga* contains a resin cimicifugin, tannin, salicylic acid, traces of an alkaloid and three crystalline alcohols of uncertain structure.

B.P.C. (1934), p.324.

DESCRIPTION

Macroscopical: Rhizome dark brown externally, hard, subcylindrical 1-2 cm in diameter and up to 15 cm long. Bears several stout ascending branches marked with encircling leaf scars terminating in a cup-shaped scar. Undersurface has attached long brittle roots sometimes broken or represented as root scars. Fracture horny, internally dark brown and waxy, or sometimes white. Exhibits a thin dark bark, a distinct cambium line and a radiate xylem 4-5 mm thick consisting of pale wedges separated by darker medullary rays; pith 3-5 mm in diameter. The roots are quadrangular, dark brown externally and longitudinally wrinkled, fracture short, internally dark brown and exhibiting a 4-rayed xylem. Odourless; taste bitter and acrid.

Microscopical: Light to dark brown powder; starch grains numerous, simple or compound, individual grains 3-15 μm in diameter, spheroidal with a central cleft, fragments of lignified vessels with scalariform thickening or bordered pits. Heavily lignified xylem fibres, thin walled; irregular yellow brown fragments of suberised epidermal cells, sometimes elongated, with thickened walls.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

Paper Chromatography: Woo, L.K., Kim, J.H. (1965), Yakhak Hoeji., 9, 34.

THERAPEUTICS

Action: Antirheumatic. Antitussive. Sedative. Emmenagogue.

Indications: 'Rheumatism'. Rheumatoid arthritis. Intercostal myalgia. Sciatica. Whooping cough. Chorea. Tinnitus aurium. Dysmenorrhoea. Uterine colic.

Specific Indications: Muscular rheumatism. Rheumatoid arthritis.

Combinations used: May be combined with Menyanthes or Apium in rheumatism. It may be used with Zanthoxylum in tinnitus.

Preparations and Dosage: (thrice daily)

Dried rhizome and root. Dose 0.3-2 g or by decoction. Liquid Extract (B.P. 1898) 1:1 in 90% alcohol. Dose 0.3-2 ml. Tincture (B.P.C. 1934) 1:10 in 60% alcohol. Dose 2-4 ml.

CINCHONA

SYNONYMS

Peruvian Bark; Jesuit's Bark.

DEFINITION

Cinchona consists of the dried bark of the many hybrids of *Cinchona ledgeriana* Moens., *C. succirubra* Pav., *C. officinalis* L. and *C. calisaya* Wedd. (Fam. Rubiaceae). These species are indigenous to South America, but hybrids are cultivated in India, Africa and the Far East. Cinchona contains not less than 6.5% of total alkaloids, of which not less than 30% and not more than 60% are of the quinine type, including quinine, quinidine, cinchonine and cinchonidine.

European Pharmacopoeia III. (1975), p.190. B.P.C. (1963), p.186. Martindale 27th Edn., p.254.

DESCRIPTION

Macroscopical: Consists of stem and root bark. Stem bark, quilled or curved pieces up to 30 cm long and 2-6 mm thick; outer surface brown to grey frequently bearing lichens and mosses, texture rough, often marked with transverse fissures and longitudinally furrowed and fissured, cork exfoliated in places; inner surface brown to deep red-brown; fracture short but fibrous in the inner layers. Root bark irregularly channelled, outer surface exhibiting conchoidal depressions, fracture fibrous. Commercial drug often chopped into pieces 2-5 mm wide and 1 cm long. Odour slight; taste bitter and astringent.

Microscopical: Reddish-brown powder. Numerous cork fragments, thick-walled polygonal cells; fragments of large secretion ducts from the inner part of the cortex; abundant fibres, yellow in colour, occur singly or in groups of two and three, up to 90 μ m in diameter with thick, lignified walls with funnel shaped pits and a narrow lumen; individual fibres fusiform with bluntly pointed ends. Parenchyma of the phloem and medullary rays, brown to yellow in colour, containing occasional starch granules 6-10 μ m in diameter. Microcrystals of calcium oxalate in idioblasts.

Jackson & Snowdon p.14.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

Cinchona complies with the identification reactions, chromatography test, assay and sulphated ash test of the European Pharmacopoeia III (1975), p.191-2.

THERAPEUTICS

Action: Bitter astringent. Orexigenic. Febrifuge. Spasmolytic. Antiprotozoal.

Indications: Malaria. Splenomegaly. Anorexia. Dyspepsia. Hyperchlorhydria. Cramp. Myalgia. Has been used in dipsomania. Influenza – as prophylactic. Pharyngitis – gargle.

Specific Indication: General debility, with anorexia.

Contra-indication: Pregnancy.

Combinations Used: May be combined with Chamaemelum, Melissa, Althaea Root, Angelica Root and Humulus in anorexia nervosa: with Millefolium, Mentha Piperita and Asclepias in influenza: with Viburnum Opulus and Zanthoxylum in cramps.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 0.3-1 g by decoction. Liquid Extract. B.P.C. (1954). Dose 0.3-1 ml. Tincture B.P.C. (1949). Dose 2-4 ml. Maximum dose (Medicines Act: Order 1977, 2130), 250 mg bark, is approximately equivalent to 2.5 ml Tr. Cinchona 1:10.

Notes: Cinchona alkaloids are precipitated by alkalis, although the sediment may be suspended in gum acacia mucilage. Cinchona is incompatible with iodides and salicylates.

CINNAMOMUM

SYNONYMS

Cinnamon Bark; Ceylon Cinnamon.

DEFINITION

Cinnamomum consists of the dried inner bark of *Cinnamomum zeylanicum* Blume (Fam. Lauraceae), a tree cultivated in Ceylon by coppicing. Cinnamomum contains not less than 1% of volatile oil containing 60 to 75% w/w of aldehydes calculated as cinnamic aldehyde (C_9H_8O) together with eugenol, phellandrene and other minor terpenes. The bark also contains tannins.

B.P.C. (1973), p.113. Martindale, 27th Edn., p.1015.

DESCRIPTION

Macroscopical: Bark occurs as single or double compound quills about 1 cm in diameter and of varying lengths; colour yellow-brown and dull; outer surface marked by occasional scars, holes and longitudinal lines or faint ridges. Cork patches rare, normally absent. Darker inner surface longitudinally striated. Fracture splintery and brittle. Odour fragrant; taste sweet and aromatic.

Microscopical: Yellow-brown powder. Sclereids mostly isodiametric, some with the inner and radial walls thicker than the outer walls. Lignified fibres up to 30 μ m in width, thick-walled, pointed ends, normally occur singly but may be in small groups. Elongated cells filled with volatile oil or mucilage. Medullary rays mainly two cells wide. Starch granules 2-4 compound, up to 10 μ m in diameter but normally smaller. Minute acicular crystals of calcium oxalate present in some parenchymatous cells.

Jackson and Snowdon, p.16.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Chromatography: Ruffini, G.J. (1965) Chromatog. 17, 483.

THERAPEUTICS

Action: Spasmolytic. Carminative. Orexigenic. Antidiarrhoeal. Anti-microbial. Refrigerant. Anthelmintic.

Indications: Flatulent dyspepsia. Anorexia. Intestinal colic. Infantile diarrhoea. Common cold. Influenza.

Specific Indications: Flatulent colic. Dyspepsia with nausea.

Combinations Used: May be combined with Filipendula, Chamaemelum, Ulmus and Althaea Root in flatulent dyspepsia and gastritis: with Geranium, Quercus, Acorus and Black Catechu in diarrhoea with colic: with Sambucus, Mentha Piperita and Millefolium in influenzal infection.

Preparations and Dosage: (thrice daily)

Dried bark, as infusion. Dose 0.5-1 g. Liquid Extract 1:1 in 70% alcohol. Dose 0.5-1 ml. Tincture B.P.C. (1949). Dose 2-4 ml.

CINNAMOMUM CASSIA

SYNONYMS

Chinese Cinnamon; Cassia Bark; Cassia Lignea.

DEFINITION

Cinnamomum Cassia is the dried bark of *Cinnamomum cassia* Blume (Fam. Lauraceae), an evergreen tree indigenous to Indo-China and Southern China and cultivated in other parts of Eastern Asia. Cinnamomum Cassia yields 1-2% of volatile oil containing cinnamaldehyde (about 75%), and tannin. B.P.C. (1949), p. 222. Martindale 27th Edn., p. 1014.

DESCRIPTION

Macroscopic: Single quills of channelled pieces up to 5 mm thick; colour dark earthy brown, except where patches of thin, greyish cork persist; inner surface lighter red-brown; fracture short and granular in the outer part, but fibrous in the inner part. Odour and taste of cinnamon.

Microscopic: Abundant polygonal-tabular cork cells arranged in alternating layers of thick-walled and thin-walled cells with red-brown contents, thick-walled cork cells lignified; abundant small-lumen fibres, up to 50 μ m wide, lumen uneven, lignified, few inconspicuous pits, occurring singly or in groups; sclereids abundant, singly or more usually found in large groups, more or less isodiametric, pitted, striated; oil cells, thin-walled, large, ovoid, associated with thin-walled parenchyma, fibres and medullary rays; medullary ray cells thin-walled, frequently containing numerous small acicular crystals of calcium oxalate; starch grains spherical to ovoid, simple or compound with four or more components, individual grains up to 22 μ m diameter.

Jackson & Snowdon p. 12.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Volatile Oil: Not less than 1% v/w. Powdered Drug. Not less than 0.7% v/w.

Chromatography: Miller, J. M. and Kirchner, J. G. (1953) *Analyt. Chem.* 25, 1107. Wellendorf, M. (1963) *Dansk Tidsskr. Farm.* 37, 145.

THERAPEUTICS

Action: Carminative. Spasmolytic. Anti-emetic. Antidiarrhoeal. Antimicrobial.

Indications: Flatulent dyspepsia. Flatulent colic. Diarrhoea. The common cold.

Specific Indications: Colic or dyspepsia with flatulent distension and nausea.

Combinations used: Combines well with Filipendula, Chamaemelum and Althea Root in flatulent dyspepsia and gastritis; with Geranium, Quercus and Catechu in diarrhoea with tormina; with Millefolium, Mentha Piperita and Sambucus in the common cold.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 0.5-1 g or by infusion. Tincture B.P.C. (1949). Dose 2-4 ml.

Oil B.P.C. (1973). Dose 0.05-0.2 ml.

CNICUS

SYNONYMS

Carbenia Benedicta; Holy Thistle; Blessed Thistle; Carduus Benedictus.

DEFINITION

Cnicus is the dried aerial parts of *Cnicus benedictus* L. (Fam. Compositae), an annual thistle-like herb growing up to 50 cm high. The herb is indigenous to Asia and the Mediterranean region and only rarely found in Britain. Cnicus is collected between June and July and contains a bitter principle, the glycoside cnicin, volatile oil, tannin and mucilage. Martindale 27th Edn., p. 254.

DESCRIPTION

Macroscopical: Stems flattened, fibrous, pubescent pieces 3-5 cm long and up to 1 cm wide, purple-brown to green externally, longitudinally ridged, pale-yellow to white internally. Leaf fragments, grey-green, thin, brittle and broken in the herb. Pieces 1-2 cm long and 1 cm wide, shortly decurrent, oblong, toothed or pinnatifid, pubescent, spinous-ciliate, veins prominent on pale under-surface. Flower heads 2 cm long by 4 cm wide, solitary on the end of long stem. Involucre ovoid, woolly, receptacle exhibiting spiny filiform scales, broken into pieces up to 3 cm long and 1 cm wide; florets rare, yellow; achenes yellow-brown, ribbed, pappus longer than the achenes. Odour faint; taste bitter.

Microscopical: Light green-yellow powder. Leaf fragments, upper surface, wavy-walled epidermal cells, numerous anomocytic stomata, large uniseriate multicellular cylindrical tapering covering trichomes with rounded ends; lower surface, veinlets prominent, epidermal cells elongated in region of the veins. Calcium oxalate absent. Receptacle scales, smooth transparent epidermal layer of slightly elongated rectangular cells, glabrous inner layer of elongated parenchyma cells. Woolly compound trichomes of the inside of the involucre consisting of long uniseriate multicellular thin-walled trichomes with oblique cross walls and pointed ends twisted into a cylinder. Florets rare, very wavy-walled epidermal cells, glabrous, occasional small clusters of calcium oxalate. Stems, large straight-walled epidermal cells, occasional large spiny trichomes, bundles of lignified pitted rectangular parenchyma cells from the xylem, long thin lignified fibres, pitted, septate with pointed ends. Large oval cells from pith.

Total Ash: Not more than 10%.

THERAPEUTICS

Action: Bitter stomachic. Antidiarrhoeal. Antihaemorrhagic. Febrifuge. Expectorant. Antibiotic. Bacteriostatic.
Topically: Vulnerary. Antiseptic.

Indications: Anorexia. Flatulent dyspepsia. Bronchial catarrh.
Topically: Gangrenous and indolent ulcers.

Specific Indications: Atonic dyspepsia. Enteropathy with flatulent colic.

Combinations used: Combines well with Chelone and Cola in anorexia with atonic dyspepsia: with Filipendula, Agrimonia and Potentilla in diarrhoea.

Preparations and Dosage: (thrice daily)

Dried flowering tops. Dose 1.5-3 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1.5-3 ml.

COLA

SYNONYMS

Kola Nuts. Cola Seeds.

DEFINITION

Cola consists of the dried cotyledons of *Cola nitida* A. Chev. and of *C. acuminata* Schott & Endl. (Fam. Sterculiaceae). The plants are large trees indigenous to Sierra Leone, North Ashanti and the Niger estuary. It is cultivated in West Africa, West Indies, Brazil and Java. Cola contains not less than 1.25% of caffeine, traces of theobromine, fat, kola red, enzymes, starch and sugar.

B.P.C. (1949), p.464.

DESCRIPTION

Macroscopical: Dried cotyledons red-brown in colour, 2-5 cm long approximately 2 cm wide, plano-convex but often distorted due to drying, externally hard and solid; fracture difficult but breaking with a uniform fracture, the fractured surface light brown in colour. Odour is not marked; taste slightly bitter and astringent.

Microscopical: Red-brown powder consisting of yellow polyhedral cells from the inner portion of the cotyledon, about 40-50 μm wide containing starch grains, ovoid or spherical, 5-10 μm and 20-30 μm in diameter and sometimes showing a protuberance and a 2-3 radiate hilum; thick walled cells of the outer part of cotyledon, brown in colour and containing tannin.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 0.5%.

Thin Layer Chromatography: Bachler, B. (1962), *Helv. Chim. Acta.*, 45, 309.

THERAPEUTICS

Action: Stimulant to higher centres of C.N.S. Thymoleptic. Antidepressive. Diuretic. Cardioactive. Anti-diarrhoeal.

Indications: Depressive states. Melancholia. Atony, Exhaustion. Dysentery. Atonic diarrhoea. Anorexia. Migraine.

Specific Indications: Depressive states associated with general muscular weakness.

Combinations used: May be used with *Turnera*, *Scutellaria* or *Avena* in depression and exhaustion.

Preparations and Dosage: (thrice daily)

Powdered cotyledons. Dose 1-3 g or by decoction. Liquid Extract (B.P.C. 1949) 1:1 in 60% alcohol. Dose 0.6-1.2 ml. Tincture (B.P.C. 1934) 1:5 in 60% alcohol. Dose 1-4 ml.

COLLINSONIA

SYNONYMS

Stone Root; Knob Root; Heal-all.

DEFINITION

Collinsonia consists of the dried rhizomes and roots of *Collinsonia canadensis* L. (Fam. Labiatae), a perennial herb growing in wooded areas of Central and Eastern United States and Canada. The rhizomes are collected in the Autumn. *Collinsonia* contains saponin, resin, tannin, organic acids and an alkaloid. B.P.C. (1934) p. 347. Martindale 22nd Edn., p. 859.

DESCRIPTION

Macroscopical: Cut rhizomes consist of irregular hard brown pieces up to 5-10 cm long and 1-2 cm thick, often cut finer. Bears short knotty branches and conspicuous cup-shaped scars of the aerial stems on the upper surface, short wiry remains of roots or depressed root scars on the lower surface. Rhizome very tough and hard, internally yellow-white, thin phloem and narrow xylem and a large pith; roots filiform, dark brown with terminal branches. Odour slight; taste pungent.

Microscopical: Brown powder; cork with yellow-brown walls, fibrovascular bundles consisting of long thin-walled fibres with tapering ends and narrow pitted vessels. Oval and elongated parenchymatous and sclerenchymatous cells, walls strongly lignified, packed with starch grains. Starch grains 2-25 μ m single and compound, shape varies from cylindrical-ellipsoidal to pear-shaped, fusiform and reniform. Pith cells, polyhedral in shape, moderately thickened and lignified. Calcium oxalate absent.

Total Ash: Not more than 3.5%.

Acid Insoluble Ash: Not more than 0.6%.

THERAPEUTICS

Action: Antilithic. Litholytic. Mild diaphoretic. Diuretic.

Indications: Renal calculus. Lithuria.

Specific Indication: Urinary calculus.

Combinations used: May be combined with *Aphanes*, *Eupatorium Purpureum* and *Hydrangea* in urinary stone or gravel.

Preparations and dosage: (thrice daily).

Dried root. Dose 1-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml. Tincture 1:5 in 40% alcohol. Dose 2-8 ml. Tincture B.P.C. (1934). Dose 2-8 ml.

COMMIPHORA RESIN

SYNONYM

Myrrh: *Balsamodendron Myrrha*.

DEFINITION

Commiphora Resin consists of the oleo-gum resin obtained from the stems of *Commiphora molmol* Engl. (Fam. Burseraceae), a shrub or small tree indigenous to North Africa and Southern Arabia. Commiphora Resin contains 25-40% of resin, 55-60% of gum, 7-17% of volatile oil and a bitter substance. The resin portion contains α , β and γ – commiphoric acids, commiphorinic acid and α and β – heerabomyrrhol; the oil contains m-cresol, eugenol, cuminaldehyde, formic acid, acetic acid, myrrholic acid and the sesquiterpene heerabolene.

B.P.C. (1973), p. 317. Martindale 27th Edn., p. 252.

DESCRIPTION

Irregular masses of agglutinated tears, externally yellow-brown to red-brown and often covered with a fine dust. Fracture brittle, surface translucent, oily and granular, frequently exhibits white patches or veins. Odour aromatic; taste bitter and acrid.

Identification Test: Triturate 0.1 g with 0.5 g of sand, shake with 3 ml of ether and filter. Evaporate the filtrate to dryness and pass bromine vapour over the residue. A violet colour develops.

Total Ash: Not more than 9%.

Volatile Oil: Not less than 7% v/w.

Foreign Organic Matter: Not more than 4% w/w.

THERAPEUTICS

Action: Antimicrobial. Astringent. Carminative. Expectorant. Anticatarrrhal. Antiseptic. Vŭlnerary.

Indications: Aphthous ulcers. Pharyngitis. Respiratory catarrh. Common cold. Furunculosis.

Topically: Wounds and abrasions.

Specific Indications: Mouth ulcers, gingivitis and pharyngitis.

Combinations used: May be combined with Echinacea, Baptisia and Uliginosum in tonsillitis and pharyngitis; with Cephaëlis as paint for mouth ulcers and inflamed gums, with Millefolium, Sambucus, Hyssopus and Capsicum in the common cold; with Hamamelis (Distilled Water) for topical application to wounds and contusions.

Preparations and Dosage: (thrice daily)

Tincture Myrrh B.P.C. (1973). Dose 1-2.5 ml. Tincture Myrrh Co. (Thompsons). 1 part Tincture Capsicum B.P.C. (1973) to 4 parts Tincture Myrrh B.P.C. (1973). Dose 1-2.5 ml.

CONVALLARIA

SYNONYM

Lily of the valley leaves.

DEFINITION

Convallaria consists of the dried leaves of *Convallaria majalis* L. (Fam. Liliaceae). The plant is a small herb, indigenous to Britain and widely distributed over Europe, North America and Northern Asia. *Convallaria* contains the cardioactive glycosides convallatoxin, convallaside and glucoconvallaside.

Martindale, 26th Ed., p.623. B.P.C. (1949) p.270.

DESCRIPTION

Macroscopical: Grey green leaves, darker on the upper surface, 12-14 cm long 2-4 cm wide, lanceolate with an entire margin, a prominent midrib, parallel venation acute apex and a short sessile petiole. Cut leaves 2-5mm, dark green pieces sometimes yellow or brown. Taste sweet at first, becoming bitter.

Microscopical: Grey-green powder, fragments of epidermis with narrow rectangular epidermal cells and frequent stomata on the upper and lower surfaces; mesophyll cells occasionally containing bundles of calcium oxalate raphides 5-10 μ m in length, lignified vessels with annular thickening.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Water Soluble Extractive: Not less than 20%.

Thin Layer Chromatography: Kukkonen, E. (1964), Farm. Aikakanslehti., 73, (12), 33-8.

Paper Chromatography: Elabanowska, A. (1969), Herba. Pol., 15 (3), 211-15.

THERAPEUTICS

Action: Cardioactive; Digitalis-like action.

Indications: Arrhythmia. Congestive heart failure. Oedema of cardiac origin. Cardiac asthma.

Specific Indication: Congestive heart failure with dropsy.

Combinations used: Combines well with *Leonurus* and *Selenicereus grandiflorus* in heart disease.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 60-200 mg or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.6-2 ml. Tincture 1:5 in 40% alcohol. Dose 0.5-1 ml. Tincture (B.P.C. 1934) 1:8 in 60% alcohol. Dose 0.3-1.2 ml.

CRATAEGUS FRUIT

SYNONYMS

Hawthorn Berries; Whitethorn Berries.

DEFINITION

Crataegus Fruit consists of the dried ripe fruits of *Crataegus oxyacanthoides* Thuill. or of *C. Monogyna* Jacq. (Fam. Rosaceae). The plants are native British shrubs, branched, thorny, with lobed leaves, bearing heads of deep red false fruits containing either one (*C. monogyna*) or two (*C. oxyacanthoides*) stony fruits.

Crataegus Fruit contains saponins, glycosides including flavonoids, and various acids including ascorbic acid.

Martindale, 25th Edn., p.537.

DESCRIPTION OF THE FRUIT

Macroscopical: (Whole Fruit); Ovoid false fruits, 6 to 13 mm long, consisting of a concave, mealy receptacle, wrinkled and shrunken, wine-red to yellow-brown, crowned by five reflexed calyx tips, enclosing the hard, thick-walled fruits, which each contain a seed. Taste mawkish and mucilaginous.

Microscopical: Covering trichomes from inside the receptacle, long, unicellular, pointed, smooth, sometimes repeatedly bent. Receptacle fragments of thickened cells, coloured red, containing isolated calcium oxalate prisms. Pericarp fragments of lignified sclereid masses. Few fragments of seed testa, yellow, with hexagonal, mucilaginous epidermal layer, beneath which is a layer of cells containing numerous elongated calcium oxalate prisms.

Deryng., p.298-9.

Total Ash: Not more than 4%.

Acid Insoluble Ash: Not more than 1%.

Paper Chromatography: Denoel (1952) J. Pharm. Belg. 7 516. Bouchardy (1951) Pharm. Acta Helv. 26 360.

THERAPEUTICS

Action: Cardiaotonic, coronary vasodilator. Hypotensive (Graham (1939) Brit. med. J. 2 951. Bodman. *ibid.* 1022).

Reputed to dissolve deposits in thickened and sclerotic arteries.

Indications: Cardiac failure, or earlier myocardial weakness. Hypertension, arterio-sclerosis. Buerger's disease. Paroxysmal tachycardia.

Specific Indications: Hypertension with myocardial weakness. Angina pectoris.

Combinations used: Combines well with *Selenicereus grandiflorus*, Tilia, Viscum or Scutellaria.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 0.3-1 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 0.5-1 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

CYPRIPEDIUM

SYNONYMS

Lady's Slipper; Nerve Root; American Valerian.

DEFINITION

Cypripedium is the dried root and rhizome of *Cypripedium pubescens* Willd. (Fam. Orchidaceae). The plant is indigenous to the United States and Canada but is grown in many parts of Europe. Cypripedium contains a volatile oil, resins, glucosides and tannins.
B.P.C. (1923), p.385.

DESCRIPTION

Macroscopical: Rhizome red-brown to brown in colour, 2-8 cm long and 2-5 mm in diameter. Upper surface has numerous cup shaped bud scars and a few red-brown buds. The lower surface has numerous roots longitudinally striated and 1-2 mm in diameter. The fracture is short, the cut surface yellow-brown with a thick cortex and central stele, exhibiting leptocentric fibro-vascular bundles. Odour heavy and distinct; taste bitter and pungent.

Microscopical: Yellow-brown powder consisting of rectangular parenchymatous cells, some with pitted walls, containing spheroidal starch grains 1-10 μm in diameter, single or compound; raphides of calcium oxalate frequently 10-20 μm long; thin sclerenchymatous fibres and lignified vessels with spiral, annular, or occasionally scalariform thickening. Brown cork cells abundant.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 5%.

Water Soluble Extractive: Not less than 20%.

THERAPEUTICS

Action: Sedative. Mild hypnotic. Spasmolytic. Thymoleptic.

Indications: Insomnia. Hysteria. Emotional tension. Anxiety states.

Specific Indication: Anxiety states with insomnia.

Combinations used: Combines well with Avena or Scutellaria in anxiety neurosis; with Humulus in insomnia with depression.

Preparations and Dosage: (thrice daily)

Dried rhizome and root. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 2-4 ml.

DATURA

SYNONYMS

Stramonium; Thorn Apple; Jimson Weed.

DEFINITION

Datura consists of the dried leaves and flowering tops of *Datura stramonium* L. (Fam. Solanaceae), and its varieties. Datura is an annual herb growing up to 1.5 m in height, cultivated in the United States of America and the Balkans. The leaves and flowering tops are collected between June and September when the plant is in flower. Datura contains not less than 0.25% of the alkaloids hyoscyamine and hyoscyne together with smaller amounts of atropine. About 30% of the alkaloids consist of hyoscyne.

B.P.C. (1973), p. 472. European Pharmacopoeia (1969) 1. p. 367.

DESCRIPTION

Macroscopical: Leaves much shrivelled, twisted and often broken, grey-green to dark-green or occasionally brown, ovate to triangular ovate in shape, 8-25 cm long and 7-15 cm wide, base unequal, petiole short and twisted. Young leaves pubescent, older leaves almost glabrous; stems twisted, slender and longitudinally wrinkled; flowers solitary, erect, about 7.5 cm long; corolla yellow-brown, occasionally purple, plicate and trumpet-shaped. Ovary superior, conical, tetralocular in the lower part, covered with emergences; ovules numerous and campylotropous; seeds brown to black and flattened, subreniform about 3 mm long, testa pitted. Odour disagreeable; taste bitter.

Microscopical: Grey-green powder; leaf fragments, epidermal cells with wavy anticlinal walls and a smooth cuticle, stomata anisocytic, more numerous on the lower surface. Non-glandular trichomes, uniseriate, 3-5 celled, conical with thin warty walls; glandular trichomes, short, one or two celled uniseriate stalk and 2-7 celled glandular head. Crystal layer of calcium oxalate clusters 10-30 μm and occasional prisms beneath the epidermis. Stem fragments, xylem vessels and fibres numerous, occasional pith cells containing calcium oxalate; pollen grains subspherical, 60-80 μm in diameter, three pores with a granular surface.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 3% of stems with a diameter exceeding 5 mm.

Standards: *Datura* complies with the tests for identity, chromatographic test and chemical assay of the European Pharmacopoeia, (1969). 1, p. 367.

THERAPEUTICS

Action: Spasmolytic. Antasthmatic.

Indications: Asthma. Pertussis. Sialorrhoea in parkinsonism.

Specific Indication: Asthma.

Combination used: May be combined with *Lobelia* and *Capsicum*, or with *Ephedra* in asthma.

Preparations and Dosage: (thrice daily)

Dried leaf. Dose 0.06-0.2 g or by infusion. Liquid Extract B.P. (1968). Dose 0.06-0.2 ml. Tincture B.P. (1973). Dose 0.5-2 ml.

DAUCUS

SYNONYM

Wild Carrot.

DEFINITION

Daucus consists of the dried aerial parts of *Daucus carota* L. (Fam. Umbelliferae), an erect hispid biennial, native to the British Isles, Scandinavia, North Africa and India. It is found mainly on chalky soils near the sea. The herb contains volatile oil and an alkaloid daucine which has a nicotine-like odour.

Merck Index, 7th Edn., p.320.

DESCRIPTION

Macroscopical: Consists mainly of cut pieces of stem, 0.25-0.75 cm long and 0.2-0.5 cm wide; yellow-brown to green in colour, occasionally purple particularly along ridges; stem has 7-10 ridges running longitudinally and a large pith. Leaf fragments dark green, 0.2 to 1 cm in length, prominent veins on the under surface; pubescent. Occasional fragments of umbels, flowers in groups cream-white, sometimes purple, less than 1 mm in length. Fruits rare, 2-4 mm long, oblong-ovoid, primary ridges ciliate, secondary ridges spiny. Odour faintly aromatic; taste slightly bitter.

Microscopical: Cream-yellow to yellow-green powder, stem fragments, epidermis elongated, wavy-walled cells with small unicellular covering trichomes, bundles of narrow fibres occasionally lignified, lignified annular and spiral vessels. Leaf epidermis with wavy-walled cells, anomocytic stomata, abundant unicellular clothing hairs; calcium oxalate absent. Corolla with wavy-walled epidermal cells: stigma, papillose epidermis: bilocular anthers: pollen grains ovoid, equatorially constricted 10-15 μ m in length.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

Thin Layer Chromatography: Stahl, E. (1964), Arch. Pharm. 197, 500.

THERAPEUTICS

Action: Diuretic. Antilithic. Carminative.

Indications: Urinary calculus. Lithuria. Cystitis. Gout.

Specific Indications: Urinary gravel or calculus.

Combinations used: May be administered with Parietaria, Galium, Hydrangea and Eupatorium Purpureum in urinary conditions.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

DIOSCOREA

SYNONYMS

Wild Yam Root; Colic Root; Rheumatism Root.

DEFINITION

Dioscorea consists of the dried underground parts of *Dioscorea villosa* L. (Fam. Dioscoreaceae). The plant is common in eastern and central United States and is a herbaceous twining perennial. Dioscorea contains steroidal glycosides including dioscline and starch.

DESCRIPTION OF CUT RHIZOME

Macroscopical: Irregular yellow hard woody chips of rhizome, up to 3 × 1 cm often with cork missing exposing brown exterior. Fine strands of brown fibrous roots present. Taste bitter, starchy and persistently acrid.

Microscopical: Powder, yellow-brown. Abundant simple spherical or ovoid starch grains up to 30 μm in diameter. Numerous fragments of lignified parenchyma with thick walls containing slit-like pits. Groups of lignified tracheids with small bordered pits. Occasional groups of fibres with narrow lumen and pitted lignified walls. Few pieces of thin-walled brown cork cells. A few calcium oxalate needles.

Total Ash: Not more than 7%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Chromatography: Blunden, G.S., Hardman, R. (1964) J. Chromatog. 15 (2) 273-6

THERAPEUTICS

Action: Spasmolytic. Mild diaphoretic. Anti-inflammatory. Anti-rheumatic. Cholagogue.

Indications: Intestinal colic. Diverticulitis. Rheumatoid arthritis. Muscular rheumatism. Cramps and intermittent claudication. Cholecystitis. Dysmenorrhoea. Ovarian and uterine pain.

Specific Indications: Bilious colic. Acute phase of rheumatoid arthritis.

Combinations used: Used in intestinal colic with *Acorus*, *Chamaemelum* and/or *Zingiber* in hot infusion. Combines well with *Viburnum Opulus* and *Cimicifuga* in rheumatoid arthritis. Has been combined with *Sambucus* and *Althaea* root for the treatment of appendicitis and diverticulitis.

Preparations and Dosage: (thrice daily)

Dried root. Dose 2-4 g or by infusion or decoction. Liquid Extract 1:1 in 45% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-10 ml.

DROSERA

SYNONYM

Sundew.

DEFINITION

Drosera consists of the dried entire plant *Drosera rotundifolia* L. (Fam. Droseraceae) gathered during the flowering period. The plant is a native British herb, growing in marshy places, small, with leaves in a basal rosette, long-petioled, roughly circular blades having reddish tentacles on the upper surface which entrap insects, and bearing a spike of white, five-petalled flowers.

Drosera contains naphthaquinones, including plumbagin.
Martindale, 25th Edn., p.1522.

DESCRIPTION OF CUT HERB

Macroscopical: Mainly small, wrinkled pieces of blackish-brown leaves which are rounded when soaked in water and have stout tentacles on one side. Stem pieces slender, brown.

Microscopical: Many ovoid secretory tentacle heads, multi-cellular, about 190 μm long and 140 μm wide, with a central mass of reticulate and spirally thickened tracheids surrounded by a narrow suberised layer, and on the outside, two layers of thin walled cells, attached to the red-brown, long, multicellular tentacle having a strand of spirally thickened vessels. Glandular trichomes with two-celled ovoid brown heads on short, two-celled, biseriate stalks. Leaf epidermal cells with slightly sinuous anticlinal walls. Stomata anomocytic, large, in both epidermises. Calcium oxalate absent. Dark globules in some mesophyll cells.

U.S.D., 22nd Ed., p.1362.

Total Ash: Not more than 5%.

Paper Chromatography: Kysela & Melicharova (1957) Cslká Farm. 6 607.
Bouchardy (1951) Pharm. Acta Helv. 26 360.

THERAPEUTICS

Action: Antispasmodic. Demulcent. Expectorant. Appears to exert relaxing effect on bronchial musculature.

Indications: Bronchitis. Asthma. Pertussis. Tracheitis. Gastric ulceration.

Specific Indications: Asthma. Chronic bronchitis with peptic ulceration or gastritis.

Combinations: Combines well with Euphorbia, Grindelia or Senega in asthma.

Preparations and Dosage: (thrice daily)

Dried plant. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml. Tincture 1:5 in 60% alcohol. Dose 0.5-1 ml.

ECHINACEA

SYNONYMS

Cone Flower; Black Sampson; *Brauneria pallida* (Nutt.); *B. angustifolia*.

DEFINITION

Echinacea consists of the dried underground parts of *Echinacea pallida* (Nutt.) Britt. or *E. angustifolia* (D.C.) Heller. (Fam. Compositae). The plant is a perennial herb native to central and south western United States. Echinacea contains inulin, sugars, resins and fatty acids.

DESCRIPTION OF CUT ROOT AND RHIZOME

Macroscopical: Small broken fragments up to 2 cm $\times$ 1 cm with much fibrous powder. Fragments brown flecked with white. Odour aromatic; taste initially sweet then bitter followed by a tingling sensation on the tongue.

Microscopical: Powder dark brown. Xylem elements lignified with spiral, reticulate and pitted thickening. Fibres isolated or in groups, narrow lumen and thick lignified walls with funnel-shaped pits and canals. Occasional stone cells. Parts of oleo-resin canals, thin-walled cells forming circular spaces within the larger thin-walled parenchyma cells which contain inulin crystals. Thin-walled polygonal cork cells with red-brown contents. Calcium oxalate and starch absent.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Antiseptic. Anti Viral. Vasodilator (peripheral).

Indications: Furunculosis. Septicaemia. Naso-pharyngeal catarrh. Pyorrhoea. Tonsillitis.

Specific Indications: Boils, carbuncles and abscesses.

Combinations used: Combines well with Lappa root and/or Iris for boils: with Baptisia and Commiphora Resin for pharyngitis or tonsillitis.

Preparations and Dosage: (thrice daily)

Dried root and rhizome. Dose 1 g or by infusion or decoction. Liquid Extract 1:1 in 45% alcohol. Dose 0.25-1 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

ELETTARIA

SYNONYMS

Cardamom Seeds; Cardamomi.

DEFINITION

Elettaria is the dried ripe seeds of *Elettaria cardamomum* Maton (Fam. Zingiberaceae), a reed-like plant indigenous to Indo-China, Ceylon and the Malabar coast. Elettaria contains not less than 4% v/w volatile oil, the principal constituents of which are α -terpinyl acetate, cineole, limonene, sabinene, α -terpinol, p-cymene, α -pinene, nerol and linalyl acetate, together with a fixed oil and starch.

Martindale 27th Edn., p. 1014. B.P.C. (1973), p. 79. B.P. (1973), p. 84. Merck Index 9th Edn., 1836.

DESCRIPTION

Macroscopical: Pale to dark red-brown seeds, oblong-ovoid, irregularly angular, 3-4 sided, about 3-5 mm long and 3 mm broad, hard, transversely rugose, 6-8 rugae in the length of the seed, the raphe lying in a longitudinal groove; seeds often agglutinated into groups of 2-7 by means of adhering membranous aril. Transverse section exhibits a dark, thin, seed-coat, a whitish perisperm grooved on one side, and in the centre a yellowish translucent endosperm surrounding a small embryo. Odour aromatic; taste pungent and slightly bitter.

Microscopical: Brown oily powder; endosperm and perisperm cells packed with polyhedral masses of starch grains, individual grains up to 4 μ m in diameter; starch masses contain from 1-7 prisms of calcium oxalate 10-20 μ m in diameter. Dark-brown sclerenchyma, individual cells 'beaker' shaped about 18-20 μ m wide and 40 μ m deep with lumen almost filled by a nodule of silica. Pericarp fragments of elongated epidermal cells accompanied by small spiral vessels. Jackson & Snowdon, p. 96.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 3.5%.

Foreign Organic Matter: Not more than 3%.

Chromatography: Nigram, H. C., Nigram, I. C., Handa, K. L. and Levi, L. (1965) J. Pharm. Sci., 54, 799.

THERAPEUTICS

Action: Carminative, Sialogogue. Orexigenic.

Indications: Flatulent indigestion. Anorexia.

Specific Indication: Flatulent dyspepsia.

Combinations used: May be combined with Cinnamomum, Carum, Zingiber, in stomach or bowel indigestion, with purgatives as a flavouring and carminative agent.

Preparations and Dosage: (thrice daily)

Dried seeds. Dose 1-2 g or by infusion. Compound Tincture Cardamomum B.P. (1973). Dose 2-4 ml.

EPHEDRA

SYNONYM

Ma-huang.

DEFINITION

Ephedra consists of the dried young stems of *Ephedra sinica* Stapf., *E. equisetina* Bunge and *E. gerardiana* Wall (including *E. nebrodensis* Tineo) (Fam. Ephedraceae). The plants are perennial herbs, the first two species being indigenous to China, whilst the last is indigenous to India. The drug is imported compressed into bales or loosely packed. Ephedra contains the alkaloids l-ephedrine, d- ψ -ephedrine together with smaller quantities of l-N-methyl-ephedrine, d-N-methyl-ephedrine, d-N-methyl- ψ -ephedrine, nor-d- ψ -ephedrine, 1-nor-ephedrine and benzylmethylamine. Ephedra contains not less than 1.25% of total alkaloids calculated as ephedrine.

B.P.C. (1954), p. 273. Martindale 27th Edn., p. 10.

DESCRIPTION

Macroscopical: Older stems woody, longitudinally wrinkled, brown or ashen in colour; young green stems, glaucous up to 30 cm long comprising the bulk of the drug, subcylindrical, somewhat ancipital, longitudinally striated and rough to the touch. Internodes vary in length from 1-6 cm; opposite and decussate leaves reduced to sheaths surrounding the stems, carrying diminutive laminae 1.5-4 mm long varying according to the species from short and blunt to subulate. Odour strong and aromatic; taste bitter.

Microscopical: Yellow-brown to green-brown powder. Consists of straight-walled, sub-rectangular epidermal cells with thickened outer walls, 22-35 μ m long in the radial direction, depressed stomata and occasional projections; groups of 9-20 fibres in ridges; cortical parenchyma of about 4-7 cells thick containing prisms of calcium oxalate; vascular tissue of spiral vessels and heavily lignified border-pitted tracheids; pith parenchyma occasionally containing dark brown contents.

Total Ash: Not more than 10%.

Thin-Layer Chromatography: Choulis, N. H. (1967) J. Pharmaceutical Sciences, 56, 196.

THERAPEUTICS

Action: Antasthmatic. Bronchodilator, Hypertensive. Peripheral vasoconstrictor. Sympathomimetic with alpha- and beta-adrenergic action. Cerebral stimulant. Cardiac stimulant, due to inotropic action of pseudoephedrine.

Indications: Asthma. Hay fever. Urticaria. Enuresis. Narcolepsy. Mysathenia gravis.

Specific Indications: Asthma, to reduce the frequency and severity of spasms. Hay fever. Allergic symptoms.

Combinations used: May be used with Lobelia, Grindelia and Symplocarpus in asthma: with Echinacea and Uliginosum in hay fever: with Equisetum in enuresis.

Preparations and Dosage: (thrice daily)

Dried stems. Dose 1-4 g or by decoction. Liquid Extract 1:1 in 45% alcohol. Dose 1-3 ml. Tincture 1:4 in 45% alcohol. Dose 6-8 ml.

Note:

1. Although Ephedra does not produce, in therapeutic dosage, the marked pressor effect of ephedrine, it should not be used in hypertensive cases in the presence of coronary thrombosis or with monoamine oxidase inhibitors.
2. Store in air-tight containers: protect from light.

EQUISETUM

SYNONYMS

Horsetail Herb.

DEFINITION

Equisetum is the dried sterile stems of *Equisetum arvense*. L. (Fam. Equisetaceae). It is a common European herb and is cultivated in Yugoslavia. Equisetum contains aconitic acid, soluble silicic compounds, some fixed oil, phytosterols, saponins, nicotine, palustrine, palustrinine and flavonoids. Martindale, 26th Edn., p.2013. Merck Index, 7th Edn., p.935.

DESCRIPTION

Macroscopical: Pieces of sterile main stem 0.5 to 2.0 cm long and 0.5 to 3 mm in diameter, bearing 6-19 deep longitudinal grooves. Lateral stems narrower with four deep grooves. Infrequent pieces of brown fertile stems with fewer grooves and ridges, and pieces of sheath 1 to 2 mm wide and 3 to 5 mm long, bearing teeth. Transverse section shows deep grooves and ridges. Cortex containing vascular canals and a large central cavity. Odour and taste slight.

Microscopical: Large pieces of epidermis, with elongated wavy-walled epidermal cells, often thickened and beaded. Numerous stomata, alternating with epidermal cells, distinguished by horizontal striated guard cells. Slightly lignified annular thickened vessels and bundles of long non-lignified narrow-lumen fibres. Large parenchymatous cells packed with minute starch grains. Deryng, p.232. Flück, *et al.*, p.251.

Total Ash: Not more than 20%.

Acid Insoluble Ash: Not more than 10%.

Water Soluble Extractive: Not less than 15%.

Gas Liquid Chromatography: Adams, Bonnett, K.R., Hall, R.J. and Kutney, J.P. (1969), *J. Chem. Soc.* 9, 456-7.

Paper Chromatography and Electrophoresis: Phillipson, J.D. and Melville, C. (1960), *J. pharm. pharmac.*, 12, 506-8.

THERAPEUTICS

Action: Genito-urinary astringent. Antihaemorrhagic. Prophylactic causing a mild leucocytosis. Locally — Styptic. Vulnerary.

Indications: Enuresis. Prostatic disease. Cystitis with haematuria. Urethritis.

Specific Indications: Inflammation or benign enlargement of the prostate gland. Urinary incontinence; enuresis of children.

Combinations used: Combines well with Hydrangea for the treatment of prostatic conditions.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-4 g or by infusion or decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

ERYNGIUM

SYNONYMS

Eringo; Sea Holly; Eryngo.

DEFINITION

Eryngium consists of the dried roots of *Eryngium maritimum* L. (Fam. Umbelliferae) collected in the autumn and chopped into pieces. It is indigenous to Europe and the coastal areas of Great Britain where it grows on sandy soil.

DESCRIPTION

Macroscopical: The roots are chopped into small pieces 0.5-4 cm long and 0.5 cm wide. The unpeeled drug is black brown externally and transversely wrinkled, some fragments crowned with the bristly remains of leaf stalks. Inner surface cream-white and granular. Fracture spongy and coarsely fibrous with a small radiate yellow xylem. Odourless; taste sweet and mucilaginous.

Microscopical: Cream-white powder consisting largely of masses of whole and broken parenchymatous cells; some cells packed with small oval grains of starch; rectangular medullary ray cells frequently containing rosette crystals of calcium oxalate 2-10 μm in diameter. Groups of narrow, wide-lumen fibres, slightly lignified and occasionally swollen at the ends; bundles of lignified spiral and annular vessels; brown-red cork cells.

Paper Chromatography: Nikonov, G. K. Ermatov, N. E. and Davidyants, S. B. (1965) Doki. Akad. Nauk. Tadzh. SSR, 8, 22.

THERAPEUTICS

Action: Diuretic. Antilithic.

Indications: Cystitis. Urethritis. Polyuria. Urinary calculus. Renal colic. Haematuria. Enlarged prostate gland. Prostatitis.

Specific Indications: Frequency of micturition associated with urinary calculi cystitis or prostatitis.

Combinations used: Combines well with Hydrangea and Eupatorium Purpureum for urinary conditions.

Preparations for Dosage: (thrice daily)

Dried root. Dose 2-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

EUONYMUS

SYNONYMS

Wahoo Bark; Spindle Bark.

DEFINITION

Euonymus is the dried bark of *Euonymus atropurpureus* Jacq. (Fam. Celastraceae), an erect shrub or slender tree growing in the Eastern and Central United States and Canada. Euonymus contains euonymol, euonysterol, homo-euonysterol, atropurpurool, furan β -carboxylic acid, dulcitol, citrullol and fatty acids.

B.P.C. (1954), p. 299. Martindale 27th Edn., p. 1337.

DESCRIPTION

Macroscopical: Normally occurs in transverse curved pieces, but occasionally in quills, 2-4 mm thick and up to 8 cm long, very light in weight; outer surface light brown, somewhat wrinkled, scaly patches of soft grey cork; few lenticels; root scars and adhering roots; inner surface lighter in colour, longitudinally striated, porous, occasionally with patches of light yellow wood adhering; fracture short, with silky projecting caoutchouc strings. The transverse section shows a narrow brown cork, a white cortex and a darker phloem. Odour faint; taste bitter and acrid.

Microscopical: Light grey-brown powder, parenchymatous fragments from the cortex containing occasional small spherical starch grains and cluster crystals of calcium oxalate; oval phloem parenchyma cells, single files of medullary ray cells, long secretory cells containing a brown amorphous mass; thin walled cork cells.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 5% of adhering wood. Not more than 2% of other foreign organic matter.

THERAPEUTICS

Action: Cholagogue. Laxative. Diuretic. Mildly cardioactive. Circulatory stimulant.

Indications: Constipation. Icterus. Cholecystitis. Cutaneous eruptions.

Specific Indication: Constipation with liver and gall bladder dysfunction.

Combinations used: May be combined with Iris in skin complaints; with Berberis, Taraxacum Root, Chionanthus and Pulsatilla in liver and gall bladder disease.

Preparation and Dosage: (thrice daily)

Dried root bark. Dose 0.3-1 g or by decoction. Liquid Extract 1:1 in 45% alcohol. Dose 0.3-1 ml. Tincture B.P.C. (1949). Dose 0.6-2.6 ml. Euonymin B.P.C. (1949). Dose 60-120 mg.

EUPATORIUM PERFOLIATUM

SYNONYMS

Boneset; Thoroughwort; Feverwort.

DEFINITION

Eupatorium Perfoliatum consists of the dried aerial parts of *Eupatorium perfoliatum* L. (Fam. Compositae) gathered during the flowering period. The plant is a perennial herb indigenous to eastern and central North America.

Eupatorium Perfoliatum contains a glycoside eupatorin, and volatile oils. B.P.C. (1923) p.426.

DESCRIPTION OF CUT HERB

Macroscopical: Green flat pieces of cut leaf. Many small involucre from the cymose-paniculate inflorescences, often matted together, with inconspicuous florets and occasional fruits with pappus hairs. Isolated pappus hairs abundant throughout the cut herb. Stem pieces ribbed, yellow-green to dark red, often split showing white pith. Taste aromatic and bitter.

Microscopical: Covering trichomes uniseriate, 2 to 20 cells, with faintly striated walls and either a blunt or pointed terminal cell, mainly on the upper epidermis. Glandular trichomes with a short unicellular stalk and multicellular head, occasionally found on the leaves but mainly on the floral parts. Epidermal cells with sinuous anticlinal walls. Stomata confined to lower epidermis, raised off the surface of the leaf with indistinct subsidiary cells. Pappus hairs multiseriate with short unicellular branches about 23 μ m in diameter. Pollen grains compositous, spherical with a spiny exine, about 17 μ m in diameter. Calcium oxalate absent.

Total Ash: Not more than 7%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Diaphoretic. Aperient.

Indications: Influenza. Acute bronchitis. Naso-pharyngeal catarrh.

Specific Indications: Influenza with deep aching, and congestion of the respiratory mucosa.

Combinations used: May be combined with *Millefolium*, *Sambucus* and *Asclepias* for influenza. *Capsicum* or *Zingiber* may be combined if desired.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1.0-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 1-2 ml. Tincture 1:5 in 45% alcohol. Dose 1-4 ml.

EUPATORIUM PURPUREUM

SYNONYMS

Gravel root; Queen of the Meadow; Joe-pye weed.

DEFINITION

Eupatorium Purpureum consists of rhizome and roots of *Eupatorium purpureum* L. (Fam. Compositae), a tall stout herb with oblong lanceolate leaves and whorls of purple flowers. It is indigenous to the United States of America and is collected in the late summer and autumn. *Eupatorium Purpureum* contains 0.07% of volatile oil, a yellow flavonoid euparin, and resin.

DESCRIPTION

Macroscopical: The rhizome is cut into small pieces 1-2 cm long and 0.5-1 cm wide, root pieces 1-2 cm long and 2-3 mm wide, occasional larger rhizome pieces 2-4 cm long and 1-2 cm wide. Rhizome hard and tough, grey-brown externally, longitudinally wrinkled, white and fibrous internally with wide medullary rays, sometimes hollow; occasionally rhizome has short lateral branches. Odour slight; taste bitter and astringent.

Microscopical: A cream-brown powder consisting of masses of parenchymatous cells often packed with minute spheroidal starch grains; bundles of lignified narrow fibres with thick walls and a narrow lumen; rectangular lignified stone cells with regular thickening occur singly or in groups of three to four, lignified narrow bundles of pitted vessels and occasional pitted tracheids; brown cork cells frequent.

Total Ash: Not more than 14%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

THERAPEUTICS

Action: Antilithic. Diuretic. Antirheumatic.

Indications: Urinary calculus. Cystitis. Dysuria. Urethritis. Prostatitis. Rheumatism. Gout.

Specific Indications: Renal or vesicular calculi.

Combinations used: May be combined with Aphanes, Parietaria, or Hydrangea in urinary calculus.

Preparations and Dosage: (thrice daily)

Dried rhizome and root. Dose 2-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 40% alcohol. Dose 1-2 ml.

EUPHORBIA

SYNONYMS

Euphorbia pilulifera; Pill-bearing spurge.

DEFINITION

Euphorbia is the entire dried herb of *Euphorbia hirta* L. (Fam. Euphorbiaceae). It is an annual herb indigenous to India and most tropical countries. The whole of the aerial part is collected whilst in flower. *Euphorbia* contains 0.4% of a glycosidal substance, tannin, fatty acids, phorbic acid, sterols, euphosterol, jambulol, melissic acid and sugars. Some samples are stated to contain 0.1% of an alkaloid.

Martindale, 26th Edn., p.709 B.P.C. (1934), p.429. Merck Index, 7th Edn., p.440.

DESCRIPTION

Macroscopical: Pieces of narrow stem, yellow-green or reddish-brown, 4-8 cm long and 2-3 mm wide. Fragments of serrate slightly pubescent leaves, green-purple or green in colour. The flowers are small, numerous and crowded together in dense cymes about 1 cm in diameter. The narrow stems which bear the inflorescence are covered with stiff yellow trichomes. Fruits are yellow, three celled, keeled capsules, 1-2 mm in diameter, containing three brown four-sided angular wrinkled seeds. Odour slight; taste bitter.

Microscopical: The powder is light yellow in colour. Pieces of leaves show wavy-walled epidermal cells, paracytic stomata, very large yellow multicellular covering trichomes. Calcium oxalate absent; fragments of reddish-brown cork and single or small groups of ovoid starch grains common. Numerous thick-walled fibres, sometimes lignified, usually associated with starch-packed parenchyma. Parenchyma of pith and medullary rays; vessels with scalariform thickening or bordered pitting or, less frequently, spiral thickening.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 5%.

Gas Liquid Chromatography: Nordal, A., Krogh, A. and Ogner, G. (1965), Acta. Chem. Scand., 19, 1705-8.

THERAPEUTICS

Action: Antasthmatic. Expectorant. Spasmolytic.

Indications: Asthma. Bronchitis. Upper respiratory catarrh. Laryngeal spasm. Intestinal amoebiasis.

Specific Indications: Bronchitic asthma.

Combinations used: May be administered with *Grindelia* in asthma and bronchitis.

Preparations and Dosage:

Dried plant. Dose 120-300 mg or by infusion. Liquid Extract (B.P.C. 1949) 1:1 in 45% alcohol. Dose 0.12-0.3 ml. Tincture (B.P.C. 1923) 1:5 in 60% alcohol. Dose 0.6-2 ml.

EUPHRASIA

SYNONYM

Eyebright.

DEFINITION

Euphrasia consists of the dried aerial parts of *Euphrasia* species (Fam. Scrophulariaceae) which bear glandular hairs (e.g. *E. brevipila*, Burnat and Gremli), gathered during the flowering period. The plants are native British herbs, upright, 2 to 30 cm tall (Bentham and Hooker – 2-6" i.e. to 15 cm. Hayward – 1-12" i.e. to 30 cm.), usually branching, with ovate, sessile, serrated leaves sheathing the stem, bearing solitary, axillary white flowers marked purple and yellow.

Euphrasia contains glycosides including aucubin, a volatile oil and astringent principles.

Note: This monograph describes commercial material of no individual species.

DESCRIPTION OF CUT HERB

Macroscopical: Fragments of green, toothed leaves. Many flat, ovoid, bilocular fruit capsules, having a depression along each side, about 5 mm long, green-brown; containing many small, elongated, reticulately marked, buff-brown seeds, about 1 mm long. Fruit sometimes partly enclosed by a four-toothed calyx. Funnel-like flower remains, shrivelled, brown-white. Many stem pieces, thin, downy, purple-brown. Taste somewhat astringent.

Microscopical: Covering trichomes many, especially along leaf veins and margin, conical, heavily warted, angled towards the leaf surface, mostly unicellular, longer and twisted on the flower. Glandular trichomes many, with uniseriate stalks of 2 or 3 cells and small, unicellular heads. Leaf epidermal cells with very sinuous anticlinal walls. Stomata anomocytic. Calcium oxalate absent. Pollen grains spherical, with a smooth exine and 3 furrows, about 40 μ m in diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

Paper Chromatography: Natherova & Fiala (1960) Farmacia 29 333.

THERAPEUTICS

Action: Anti-catarrhal. Astringent. Eye Lotion – anti-inflammatory.

Indications: Nasal catarrh. Sinusitis. Conjunctivitis (locally as eye lotion).

Specific Indications: Conjunctivitis.

Combinations used: Used with Hydrastis and Hamamelis Water as eye lotion.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

FAGOPYRUM

SYNONYM

Buckwheat.

DEFINITION

Fagopyrum consists of the dried leaves and flowers of *Fagopyrum esculentum* Moench (Fam. Polygonaceae), an erect little-branched nearly glabrous annual about 50 cm high. The herb is indigenous to central Asia, but occurs in Europe as a casual on waste ground. It is often cultivated as a substitute for green crops or cereals. Fagopyrum contains the flavonoid glycosides quercetrin and rutin, from 3-8% in the leaves and flowers.

DESCRIPTION

Macroscopical: Consists mainly of pieces of dark green cut leaf, about 5-8 mm long and 2-4 mm wide, darker on the upper than the lower surface. Abundant fragments of cut stems and petioles up to 2 cm long and 2 mm wide, green-brown in colour. Occasional pink-white flowers, 1-2 mm long, occurring mainly as a cymose panicle and sometimes as broken individual flowers.

Microscopical: A green powder consisting of fragments of leaves and flowers. Epidermal cells with slightly wavy anticlinal walls. Anomocytic stomata infrequent. Unicellular clothing trichomes, principally near the veins. Calcium oxalate abundant in the mesophyll, consisting of small prisms and some clusters 20-30 μ m in diameter. Vessels are slightly lignified with annular or reticulate thickening; frequent bundles of stem fibres. Bilocular anthers with portions of filaments attached; pollen grains spherical with a warty exine, 30-60 μ m in diameter; papillose epidermis of stigma; corolla has a papillose inner epidermis, outer epidermis exhibits some glandular trichomes with a unicellular stalk and a multicellular head.

Thin Layer Chromatography: Kaivano, N., Miura, H. and Kikuchi, H. (1964), J. Pharm. Soc., Japan, 84, 469. Birkofer, L. and Kaiser, C.H. (1962), Z. Naturforsch, 17b, 352.

THERAPEUTICS

Action: Antihæmorrhagic. Hypotensive.

Indications: Petechiae due to capillary fragility. Retinal hæmorrhage. Purpura. Frostbite and chilblains. Hypertension. Radiation damage.

Specific Indication: Raised arterial tension with capillary bleeding.

Combinations used: Combines well with vitamin C in reducing capillary permeability.

Preparations and Dosage: (thrice daily)

Dried leaf. Dose 2-4 g or by infusion; or as compressed tablets.

Note: Fagopyrum should be stored in the dark.

FILIPENDULA

SYNONYMS

Meadow-sweet; *Spiraea ulmaria*.

DEFINITION

Filipendula consists of the dried aerial parts of *Filipendula ulmaria* L. Maxim (Fam. Rosaceae). The plant is a native British herb, up to 120 cm tall, with long-petioled leaves composed of 2 to 5 pairs of ovate, serrate leaflets which are whitely tomentose beneath, and rounded heads of creamy-white, 5 petalled flowers with many protruding stamens.

Filipendula contains salicylic glycosides including spiraein and gaultherin, and flavonoids.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf masses, of the finely broken leaflets, clinging, dull, dark green. Many stem pieces, thin walled, hollow, split, longitudinally ridged, shiny pale buff colour.

Microscopical: Leaf covering trichomes of 2 types: some unicellular, thick walled, tapering, with a thickened, pitted base; many thin-walled and narrow, less than 5 μm in width, long, curled and tangled, apparently unicellular. Leaf epidermis with slightly sinuous anticlinal walls. Stomata anomocytic, in the lower epidermis only. Calcium oxalate clusters scattered in the mesophyll, up to 40 μm in diameter. Pollen grains spherical, with a smooth exine and 3 pores, 15 to 20 μm in diameter.

Deryng., p. 196-7 (flowers). Flück *et al.* p. 104-5 (flowers).

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

Paper Chromatography: Horhammer, Hansel, Kriesmair & Endres (1955) Arch. Pharm., Berl. 288, 419.

THERAPEUTICS

Action: Stomachic. Mild urinary antiseptic. Antirheumatic. Astringent. Antacid.

Indications: Atonic dyspepsia with heartburn and hyperacidity. Acute catarrhal cystitis. Rheumatic muscle and joint pains. Diarrhoea of children.

Specific Indications: Peptic ulcer, used for prophylaxis and treatment.

Combinations used: Combines well with *Althaea* and *Melissa* in treatment of gastric conditions, and with *Ballota* in vomiting.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 4-6 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1.5-6.0 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

FOENICULUM

SYNONYMS

Fennel; Fennel Fruit.

DEFINITION

Foeniculum consists of the dried fruits of cultivated plants of *Foeniculum vulgare* var. *vulgare* (Mill.) Thelung (Fam. Umbelliferae), a perennial herb indigenous to Europe but cultivated in India, China and Egypt. *Foeniculum* contains not less than 1.2% V/w of volatile oil, the main components of which are anethole and (+) - fenchone).

B.P.C. (1973), p.194. Martindale 27th Edn., p.1018.

DESCRIPTION

Macroscopical: Entire cremocarps with pedicels attached, 4-10 mm long and 1-4 mm wide, oblong, laterally compressed, green to yellow-brown, glabrous, bifid stylopod at the apex. Mericarps have five prominent yellow primary ridges. Transverse section: pericarp has two commissural vittae, four dorsal vittae between the ridges, each ridge exhibiting a vascular strand. Embryo small, embedded in the upper end of an oily endosperm: commissural surface flat. Odour and taste aromatic.

Microscopical: Green-yellow or yellow-brown powder. Epicarp fragments, thin-walled polygonal cells with a smooth cuticle and occasional anomocytic stomata; lignified reticulate parenchyma of the mesocarp occurs in groups of rectangular cells with thickened walls and numerous oval or rounded pits: endocarp fragments, sheets of lignified cells frequently showing a parquetry arrangement, often associated with large, thick-walled, lignified, oval to rectangular cells of the mesocarp. Fragments of vittae, thin-walled cells polygonal in surface view and containing yellow-brown resin or oil. Elements of the fibro-vascular bundles, fibres pitted, vessels pitted or spirally thickened. Endosperm fragments, polygonal thick-walled cells containing fixed oil and aleurone grains. Minute rosette crystals of calcium oxalate in the centre of some aleurone grains. Starch absent.

Jackson and Snowdon, p.134.

Total Ash: Not more than 11%.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 1.5%.

Water Soluble Extractive: Not less than 10%.

Thin-Layer Chromatography: Hörhammer, L., Wagner, H., Richter, G., König, H.W. and Heng, J. (1964). *Deutsch. Apoth. Ztg.* 104: (1398). Bhatnagar, J.K., Handa, S.S. (1968) *Research Bull. Punjab University* 19 331-334.

THERAPEUTICS

Action: Carminative. Aromatic. Orexigenic. Anti-inflammatory. Anti-microbial. Diuretic.

Indications: Flatulent dyspepsia. Anorexia. Flatulent colic in children. Topically: Conjunctivitis. Blepharitis (eye wash). Pharyngitis (gargle).

Specific Indication: Flatulence in infants.

Combinations Used: Combines with Chamaemelum, Acorus and Alpinia in flatulent colic; with Agathosma and Arctostaphylos in bacterial cystitis; with Rosmarinus, Salvia and Hamamelis as gargle in mouth and throat inflammation.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 0.3-0.6 g or as infusion. Liquid Extract. 1:1 in 70% alcohol. Dose 0.8-2 ml. Aq. Foenic. Conc. B.P.C. (1934). Dose. 0.3-1 ml. Aq. Foenic. Dest. B.P.C. (1934). Dose 15-30 ml.

FRANGULA

SYNONYMS

Rhamnus frangula L., Alder Buckthorn Bark; Frangula Bark.

DEFINITION

Frangula is the dried bark from the stems and branches of *Frangula alnus* Mill. (Fam. Rhamnaceae), a shrub growing to a height of about 5 metres and found in Europe and Western Asia. The bark is collected in the spring and is allowed to mature for one year before use. Frangula contains anthraquinone glycosides, including frangulin a and b, glucofrangulin a and b, and emodin glucoside.

B.P.C. (1949), p.364. Martindale 27th Edn., p.1337.

DESCRIPTION

Macroscopical: Bark occurs in single or double quills and occasionally in channelled pieces. Quills 1-2 cm wide, up to 1 mm thick and of a papery texture; outer surface brown to black or purple, smooth, bearing numerous transversely elongated white lenticels. When the outer cork is scraped a crimson inner layer becomes evident. Inner surface brown, longitudinally striated. Older bark with brownish roughened cork and an orange inner surface. Fracture short, fibrous in the phloem. Transversely cut surface, narrow cork and a yellow-brown cortex and phloem. Odour faint; taste sweet and then faintly bitter.

Microscopical: Yellow-brown powder. Numerous groups of fibres surrounded by a sheath of prismatic calcium oxalate crystals, individual fibres much thickened and lignified with a narrow lumen and few pits. Calcium oxalate abundant, prisms and clusters up to 25 μm in diameter. Polygonal parenchymatous cells, some with unevenly thickened walls, occasionally containing spheroidal starch grains 30-10 μm in diameter and cluster crystals of calcium oxalate. Collenchymatous cells of cortex polygonal with yellow-brown contents. Abundant fragments of cork, cells polygonal with slightly thickened walls and containing purple-red colouring matter. Stone cells absent.

Jackson & Snowdon, p.20.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 13%.

Thin-Layer Chromatography: Longo, R., Meinardi, G., Korte, K. (1964). Arch Pharm. 297, p.331.

THERAPEUTICS

Action: Laxative. Mild cathartic.

Indication: Constipation.

Combinations Used: May be combined with Berberis Vulgaris, Glycyrrhiza and Cassia Fruit in Constipation.

Preparations and Dosage: (thrice daily)

Liquid Extract. 1:1 in 25% alcohol. Dose. 2-5 ml.

FUCUS

SYNONYMS

Bladder-wrack; Sea-wrack; Kelp-ware; Black-tang.

DEFINITION

Fucus consists of the whole plant of *Fucus vesiculosus* L. and other species (Fam. Fucaceae) dried as soon as possible after collection. The seaweed is found attached to rocks along the coasts of the North Atlantic Ocean and occurs as a flat, mucilaginous, olive brown thallus with spherical air vesicles. Fucus contains a gelatinous substance, algin; mannitol; β -carotene and zeaxanthin. Small variable amounts of iodine and very small amounts of bromine, occurring as inorganic salts with only traces in organic combination.

Martindale, 25th Edn., p. 79 B.P.C. (1949) p. 365.

DESCRIPTION OF CUT THALLUS

Macroscopical: Grey to black, thin, flattened pieces of thallus, up to 0.5 cm wide and 2 cm long, hard and brittle when dry, becoming softer and mucilaginous when wet; occasional whole air vesicles present, more found broken showing light brown interior. Odour typical of seaweed; taste mucilaginous.

Microscopical: Powder reddish brown; numerous fragments of epidermis with polygonal cells, elongated hypodermal cells and irregular fragments of pseudoparenchyma with thick mucilaginous walls.

Deryng, p. 358.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Anti-hypothyroid. Anti-obesic. Anti-rheumatic.

Indications: Myxoedema. Lymphadenoid goitre. Obesity. Rheumatism and rheumatoid arthritis, internally and/or the juice applied topically.

Specific Indications: Obesity associated with hypothyroidism.

Combinations used: May be combined with *Jacobaea* and *Gaultheria* in a paraffin base for application as a plaster to affected joints in rheumatoid arthritis.

Preparations and Dosage: (thrice daily)

Dried thallus. Dose 5-10 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 4-8 ml.

FUMARIA

SYNONYM

Common Fumitory.

DEFINITION

Fumaria consists of the dried aerial parts of *Fumaria officinalis* L. (Fam. Fumariaceae) gathered during the flowering period. The plant is a British native herb, forming a robust tuft, with finely subdivided leaves of linear-oblong lobes, bearing spikes of elongated light red flowers with darker tips, the lower flowers being succeeded by small, nearly spherical nutlets.

Fumaria contains bitter alkaloids.

DESCRIPTION OF CUT HERB

Macroscopical: Green fragments of the bipinnate, glabrous leaves. Flower petals shrunk, red-violet. Fruits slightly flattened and keeled spheres, about 2 mm in diameter, green containing one seed. Many stem pieces ribbed, hollow, collapsed, light green brown in colour. Taste somewhat bitter.

Microscopical: Trichomes absent. Leaf epidermal cells with sinuous anticlinal walls. Stomata anomocytic. Calcium oxalate absent. Pollen grains spherical, with a pitted exine, and 6 large pores, about 30 to 40 μm in diameter.

Total Ash: Not more than 16%.

Acid Insoluble Ash: Not more than 5%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

THERAPEUTICS

Action: Weak diuretic. Laxative.

Indications: Cutaneous eruptions. May be used as eye lotion in conjunctivitis.

Specific Indications: Chronic eczema.

Combinations used: With *Lappa* or *Galium*.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 1-4 ml.

GALEGA

SYNONYMS

Goat's Rue; French Lilac.

DEFINITION

Galega consists of the dried aerial parts of *Galega officinalis* L. (Fam. Papilionaceae) gathered during the flowering period. The plant is a native South-East European herb, introduced to Britain, up to 150 cm tall, upright with leaves composed of 13 or 15 lanceolate leaflets, bearing spikes of lilac to white elongated papilionate flowers.

Galega contains an alkaloid galegine, flavonoids and saponins. Martindale, 25th Edn., p. 1524.

DESCRIPTION OF CUT HERB

Macroscopical: Mainly entire, or pieces of the light green, apparently glabrous leaflets with entire margin, mucronate apex, and veins leaving the midrib at a very acute angle. Discoloured flower fragments including flat coiled keels. Unripe fruits, cylindrical pods containing elongated, reniform seeds about 3 mm long. Pieces of rachis and stem, the latter finely grooved and hollow. Taste somewhat bitter.

Microscopical: Covering trichomes long, unicellular, pointed, smooth, often appressed to the surface, with a lumen present at the base only, scarce on the leaflets, numerous on the flowers and fruits. Leaf epidermal cells with polygonal anticlinal walls on the upper surface, and sinuous walls on the lower surface, cuticle finely striated. Stomata anomocytic. Calcium oxalate prisms accompanying the veins. Pollen grains nearly spherical, with a smooth exine and 3 pores, about 20 μ m in diameter.

U.S.D., 22nd Edn., p. 1388.

Total Ash: Not more than 10%.

Paper Chromatography: Schaefer & Stein (1967) *Naturwissenschaften* 54 205.

THERAPEUTICS

Action: Hypoglycaemic agent, antidiabetic. (Muller and Reinwein (1927) Arch. exptl. Path. Pharm. 125 212). Weak diuretic.

Indications: Diabetes mellitus. In therapeutic dosage response is gradual over a period of time. If the patient is on insulin therapy, the insulin must be continued. The dosage may be adjusted according to the usual criteria, viz., glucose concentration in blood and urine.

Combinations used: Has been used in combination with Syzygium.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml. Tincture 1:10 in 45% alcohol. Dose 2-4 ml.

GALIUM

SYNONYMS

Cleavers; Clivers; Goosegrass.

DEFINITION

Galium consists of the dried aerial parts of *Galium aparine* L. (Fam. Rubiaceae) gathered during the flowering/fruiting period. The plant is a native British herb, scrambling in growth, up to 120 cm tall, with four-angled, rough stems and whorls of narrowly linear leaves with prickly margins, bearing small heads of whitish flowers, followed by two-lobed bristly fruits.

Galium contains a glycoside asperuloside.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments few, dull, dark green, narrow, about 2 mm wide with a sharply acute apex and prickly margins, and with a single central vein which is prickly on the lower surface. Fruits grey-green separating into nearly spherical lobes, roughly bristly, up to 2 mm in diameter. Many stem pieces, quadrangular in cross section, hollow and thin walled, shiny dark green, with light buff, roughly serrated longitudinal ridges at the angles.

Microscopical: Covering trichomes of the leaf unicellular, thick walled and thorn-like, along the margins and veins, about 70 to 110 μm long. Epidermal cells with sinuous anticlinal walls. Stomata paracytic, on the lower surface only. Calcium oxalate in large elongated mesophyll idioblasts, bundles of fine needles, about 110 to 360 μm long by 30 μm wide.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

THERAPEUTICS

Action: Diuretic. Astringent (Mild).

Indications: Dysuria. Lymphadenitis. Psoriasis.

Specific Indications: Enlarged lymph nodes.

Combinations used: With Althaea in cystitis.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Expressed juice 3-15 ml.

GAULTHERIA

SYNONYMS

Wintergreen; Aromatic Wintergreen; Teaberry; Checkerberry.

DEFINITION

Gaultheria consists of the dried leaves and stems of *Gaultheria procumbens* L. (Fam. Ericaceae), a low evergreen shrub producing slender creeping subterranean stems. The plant is common throughout the eastern United States and Canada. Gaultheria contains a glucoside which yields glucose and methyl salicylate on hydrolysis, the latter being the chief constituent of the volatile oil produced by steam distillation. Yields of volatile oil are from 0.5 to 1%.

Martindale, 25th Edn., p. 1262.

DESCRIPTION

Macroscopical: Consisting of cut pieces of leaves and stems. Fragments of leaf 2-10 mm in length, 2-5 mm in width, brown-green and smooth on the upper surface, grey-brown on the lower surface, margin serrate. Stem pieces 2-5 cm long, 1 mm wide, fracture short, pale brown fibrous cork and a cream cut surface.

Microscopical: Green brown powder containing leaf and stem features. Leaf fragments, upper surface wavy-walled epidermal cells with few stomata; lower surface slightly wavy-walled epidermal cells, numerous anisocytic stomata. Clusters of calcium oxalate in the mesophyll, veinlets with annular narrow vessels and bundles of long branched fibres with thick walls and narrow lumens. Stem tissue consisting of parenchymatous cells containing oval starch grains 1-2 μ m in diameter, pitted lignified parenchyma of xylem and pith, elongated pitted thick walled sclereids, pitted and reticulate vessels, brown cork cells.

Chromatography: Towers, G.H.N., Tse, Aida and Maass, W.S.G. (1966), *Phytochem. J.*, 4, 677.

THERAPEUTICS

Action: Anti-inflammatory. Antirheumatic. Mild analgesic. Diuretic.

Indications: Rheumatic conditions with periarticular inflammation. Intercostal neuralgia. Myalgia. Sciatica.

Specific Indication: Rheumatoid arthritis.

Combinations used: May be combined with *Filipendula* and *Menyanthes* in rheumatic conditions.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 0.5-1 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-1 ml. Volatile Oil — external application as a liniment.

GELSEMIUM

SYNONYMS

Yellow Jasmine Root; *Gelsemii Radix*.

DEFINITION

Gelsemium is the dried rhizome and root of *Gelsemium sempervirens* (L.) Ait. f. (Fam. Loganiaceae). The plant is a perennial woody climber indigenous to the South Eastern U.S.A. *Gelsemium* contains 0.5% of related indole alkaloids including gelsemine, sempervirine, gelsemicine, gelsedine and gelseverine. The plant also contains β -methyl aesculetin, pentatriacontane and the mono-methyl ether of emodin.

B.P.C. (1973), p. 208. Martindale 27th Edn., p. 1763.

DESCRIPTION

Macroscopic: Rhizome, straight cylindrical pieces 3-30 cm long and 5-30 mm thick; externally light-brown to purple-brown, longitudinally wrinkled and transversely fissured; upper surface with few stem-scars and occasional small portions of aerial stems; under surface and sides with attached roots or root fibres; fracture tough and fibrous, internally pale-yellow or light-brown, wood distinctly radiate in narrow yellow wedges, pith disintegrated, bordered by four strands of intraxylary phloem. Roots, light-brown, 3-20 cm long and 2-3 mm thick. The scraped or broken surface of the drug exhibits a blue fluorescence when exposed to filtered ultra-violet light. Odour faintly aromatic; taste bitter.

Microscopic: A dark yellow powder; cork fragments, cells yellowish to brown and lignified, occur in several layers; lignified border-pitted vessels and tracheids occurring in dense masses, xylem fibres, long, narrow, lignified; stone cells few, thick porous strongly-lignified walls; starch grains spherical 4-12 μm in diameter; monoclinic prisms of calcium oxalate from 15-30 μm long.

Foreign Organic Matter: Not more than 2.0%.

Content of Total Alkaloids: Gelsemium complies with the assay for total alkaloids of the B.P.C. (1973), p. 209.

THERAPEUTICS

Action: Analgesic. Sedative. Hypotensive.

Indications: Neuralgia of face or head. Migraine.

Specific Indications: Migraine. Trigeminal neuralgia.

Combinations used: May be combined with *Piscidia* and *Valeriana* for migraine; with *Humulus* or *Passiflora* in intercostal neuralgia.

Preparation and Dosage: (thrice daily)

Root and rhizome. Dose 15-60 mg or by decoction. Tincture B.P.C. (1973). Dose 0.3 ml.

Undesirable effects: Vertigo, diplopia, ptosis. Avoid in debilitated cases with low blood pressure, in cardiovascular disease and in myasthenia gravis.

GENTIANA

SYNONYMS

Gentian. *Radix gentianae*.

DEFINITION

Gentiana consists of the dried rhizomes and roots of *Gentiana lutea* L. (Fam. Gentianaceae), a perennial herb indigenous to Central and Southern Europe. The roots and rhizomes are collected in the late summer and autumn and dried slowly during which time the characteristic odour develops. Gentiana contains the glycosides gentiin and gentiamarin produced during drying by enzymic action from gentiopicroin, a flavonoid gentisin, a trisaccharide gentianose, enzymes, pectin and oil.

B.P. (1973), p. 217. B.P.C. (1973), p. 210. Martindale, 26th Edn., p. 326. European Pharmacopoeia, Vol. 1, p. 295.

DESCRIPTION

Macroscopical: Nearly cylindrical pieces, either entire or longitudinally split, from 5-25 cm in length and 2-4 cm in diameter, occasionally being larger at the crown, outer surface yellow-brown to brown. Root longitudinally wrinkled, rhizomes sometimes branched, frequently terminating in a bud and bearing numerous encircling leaf scars appearing as transverse annulations. Fracture short and hard, transverse surface red-yellow exhibiting a dark cambium ring, separating a wide bark from the xylem. Odour characteristic. Taste initially sweet and then bitter.

Microscopical: Light brown to yellow powder, consisting of thick walled parenchymatous cells often containing globules of oil and small groups of needles and prisms of calcium oxalate 3-6 μm in length; fragments of strongly lignified reticulate vessels, yellow-brown cork cells; occasional small starch grains.

Jackson & Snowdon, p. 152.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 33%.

Thin Layer Chromatography: Stahl, E. and Schorn, P.J. (1961), *Z. Physiol. Chem. Hoppe-Seylar's*, 325, 263.

THERAPEUTICS

Action: Bitter. Gastric stimulant. Sialagogue. Cholagogue.

Indications: Anorexia. Atonic dyspepsia. Gastro-intestinal atony.

Specific Indication: Dyspepsia with anorexia.

Combinations used: Combines with Zingiber, *Elettaria* and *Rheum palmatum*.

Preparations and Dosage: (thrice daily)

Dried rhizome and root. Dose 0.6-2 g or by infusion or decoction. Tincture 1:5 in 45% alcohol. Dose 1-4 ml.

GERANIUM HERB

SYNONYM

American Cranesbill Herb.

DEFINITION

Geranium Herb is the dried aerial parts of *Geranium maculatum* L. (Fam. Geraniaceae), collected in flower. It is a perennial herb indigenous to Canada, Eastern and Central United States.

DESCRIPTION

Macroscopical: Leaves pale green to brown, up to 2 cm wide and 1 cm long but sometimes smaller; polygonal in outline on a long petiole, divided nearly to the base, pinnately lobed, lobes 2 mm across, secondary lobes linear or oblong-linear, normally entire; upper leaves smaller, lanceolate in shape and less lobed. Flowers, peduncles 2-3 cm long, pedicels narrower but often broken; sepals oblong-ovate, mucronate, pubescent on the veins, petals violet to purple in the dried herb; carpels covered with silky white hairs, beak up to 2 cm long at the top and sometimes twisted. Stems, cut into pieces 1-2 cm long, 0.2-0.5 cm wide, pale green to purple-brown in colour, longitudinally striated and ridged, normally hollow. Odour faintly aromatic; taste slightly bitter.

Microscopical: Green-brown powder; leaf fragments, epidermal cells with wavy anticlinal walls, anomocytic stomata frequent; trichomes of two types, covering trichomes uniseriate, warty and thick-walled unicellular; glandular trichomes unicellular head with unicellular or bicellular uniseriate stalk. Striated epidermis of the sepals with stomata and trichomes similar to the leaf; large clusters of calcium oxalate crystals arranged in regular mosaic between the veins. Elongated beaded epidermal cells of the stem, bundles of septate fibres and some pith parenchyma.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Gas-Liquid Chromatography: See Geranium Root.

THERAPEUTICS

Therapeutic uses of the herb are those of Geranium Root.

Preparation and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion.

GERANIUM ROOT

SYNONYM

American Cranesbill.

DEFINITION

Geranium Root is the dried rhizome of *Geranium maculatum* L. (Fam. Geraniaceae), a perennial herb indigenous to Canada, Eastern and Central United States; rhizomes collected late summer and autumn. Contains 15-25% of gallitannin.

DESCRIPTION

Macroscopical: Rhizomes horizontal, cylindrical, tuberculate or irregularly curved, 2.5-10 cm long, 3-15 mm in diameter, externally dark brown, wrinkled, upper and side portions with numerous buds and circular stem scars; under surface with numerous root scars; fracture short, internally light brown with thin bark, indistinct xylem and a large pith. Taste astringent.

Microscopical: Red brown powder, parenchyma cells packed with oval starch granules, 10-20 μm in length with a hilum at the broad end and concentric striations; clusters and rosettes of calcium oxalate up to 80 μm in diameter; reticulate and pitted vessels, occasional yellow brown resin masses, cork cells.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Gas-Liquid Chromatography: Rollet, M., Guisinaud, G. and Monghal, M.A. (1969), Ann. Pharm. Fr., 27 (6), 433-8.

THERAPEUTICS

Action: Astringent. Anti-haemorrhagic. Vulnerary.

Indications: Diarrhoea. Dysentery. Haemorrhoids. Duodenal ulceration. Haematemesis. Melaena. Menorrhagia. Metrorrhagia. Topically – Leucorrhoea (douche). Indolent ulcers.

Specific Indications: Diarrhoea, particularly in young and old. Peptic ulcer.

Combinations used: May be combined with Geum, Agrimonia or Symphytum Root in duodenal ulcer. Used with Bidens in haemorrhage from digestive tract. A decoction, with Trillium (1 part of each to 20) may be used as a douche in leucorrhoea.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 45% alcohol. Dose 1-2 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

GEUM

SYNONYMS

Avens; Herb Bennet; Colewort; Benedict's Herb.

DEFINITION

Geum consists of the dried aerial parts of *Geum urbanum* L. (Fam. Rosaceae). The plant is a native British herb up to 60 cm tall, upright, with leaves composed of 2-3 pairs of unequal pinnate leaflets. Few yellow-petalled flowers with hairy hooked carpels remaining as a sessile head in fruit.

Geum contains volatile oil and tannins.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments folded and curled, dark green on upper surface, paler on lower, some pieces showing white hairs. Occasional carpels covered in soft white hairs, some with fine hooked awn $1\frac{1}{2}$ times length of carpel. Stem pieces hollow, flattened and smooth, some pieces split open; green to reddish brown. Taste bland, slightly astringent.

Microscopical: Anisotropic covering trichomes long, unicellular, pointed with thick lignified walls surrounded with loose spiral thickening. Glandular trichomes with unicellular ovoid heads and uniseriate stalks of 2 to 3 cells. Leaf epidermal cells with sinuous anticlinal walls, more so in lower epidermis. Anomocytic stomata confined to lower epidermis. Large calcium oxalate clusters occur as a crystal layer in the mesophyll. Pollen grains spherical with a smooth exine and three furrows, about 20 μm in diameter.

Total Ash: Not more than 9%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

Thin Layer Chromatography: Tyihak, E., Palyi, I., & Palyi, V. (1965) *Naturwissenschaften* 52 (9) 209.

THERAPEUTICS

Action: Antidiarrhoeal. Antihæmorrhagic. Febrifuge.

Indications: Diarrhoea. Catarrhal and ulcerative colitis. Passive uterine hæmorrhage. Intermittent fevers.

Specific Indications: Ulcerative colitis.

Combinations used: Used in colitis with *Agrimonia* and/or *Bidens*.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

GILEADENSIS

SYNONYMS

Poplar buds; Balm of Gilead Buds.

DEFINITION

Gileadensis consists of the air dried, closed, winter leaf buds of *Populus gileadensis* Rouleau (Fam. Salicaceae). The plant is a tree introduced to Britain.

Gileadensis contain salicin, salicin benzoate and oleo-resin.

Martindale, 25th Edn., p. 1542.

DESCRIPTION OF BUDS

Macroscopical: Conical or pyramidal, pointed, up to 25 mm in length and 15 mm in thickness; reddish-brown to brown, glossy and glutinous. Consists of a few immature leaves at the centre enclosed by about 15 oblong, pointed, concave closely packed scales. Odour pleasant balsamic; taste aromatic and bitter.

Microscopical: Epidermal cells of bud scales polygonal with thickened and heavily cutinized walls. Unicellular, conical, pointed trichomes. Mesophyll cells with yellowish-brown contents or calcium oxalate rosettes up to 20 μ m in diameter. Numerous stone cells in groups.

U.S.D., 22nd Ed., p. 869.

Acid Insoluble Ash: Not more than 1%.

THERAPEUTICS

Action: Stimulating expectorant. Antiseptic. Counter-irritant.

Indications: Chronic bronchitis. Acute and chronic affections of the upper respiratory tract. Topically as ointment in myalgia, arthritis and gout.

Specific Indications: Laryngitis with aphonia. Respiratory affections of children.

Combinations used: Used in a syrup with *Pinus strobus* and *Prunus* (U.S. Disp., 22nd edition).

Preparations and Dosage: (thrice daily)

Dried buds. Dose 4 g by infusion. Liquid Extract 1:1 in 90% alcohol. Dose 4-8 ml.

GLYCYRRHIZA

SYNONYMS

Liquorice Root; Liquiritiae Radix.

DEFINITION

Glycyrrhiza is the dried root and stolon of *Glycyrrhiza glabra* L. (Fam. Leguminosae), a tall erect herbaceous perennial distributed over Southern Europe. It is obtained mainly from Russia, Turkey, Syria and Iran. Glycyrrhiza contains about 7% of glycyrrhizin, triterpenoid acids, flavonoid glycosides, glucose, sucrose and starch.

B.P.C. (1973), p. 269. European Pharmacopoeia (1971), 2 p. 293.

DESCRIPTION

Macroscopical: Nearly cylindrical tapering pieces of root 15-20 cm long, 0.5-3 cm in diameter. Externally brown; traces of lateral roots; cork coarsely fibrous, longitudinally striated; inner surface where exposed, white to yellow and fibrous. Stolons cylindrical, 1-2 cm in diameter and may be up to several metres in length. Fracture of both root and stolon fibrous and granular. Transverse section shows thin cork, wide, yellow secondary phloem, cylindrical yellow xylem with a radiate structure. Stolon exhibits a central pith. Odour characteristic; taste sweet and faintly astringent.

Microscopical: Light yellow powder; starch grains numerous, mainly single, ovoid to ellipsoid 2-20 μm in diameter; fragments of large oval medullary ray cells; phloem fibres lignified, long, occur singly or in groups, frequently surrounded by a layer of parenchyma cells each containing a single prism of calcium oxalate, 10-25 μm wide; vessels large, walls with closely arranged bordered pits, often associated with lignified parenchyma; red-brown cork fragments, cells polyhedral and tabular.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 25%.

Tests for Identification and Chromatography: Glycyrrhiza complies with the identification reaction, chromatographic test, Curcuma test and sulphated ash reaction of the European Pharmacopoeia, (1971), 2 p. 294-295.

THERAPEUTICS

Action: Expectorant. Demulcent. Spasmolytic. Anti-inflammatory. Adrenal agent. Mild laxative.

Indications: Bronchial catarrh. Bronchitis. Chronic gastritis. Peptic ulcer. Colic. Primary adrenocortical insufficiency.

Specific Indications: Gastric or duodenal ulcer. Addison's disease.

Combinations used: May be combined with *Linum*, *Lobelia* and *Capsicum* in bronchitis; with *Symphytum*, *Chamaemelum*, *Filipendula* and *Althaea Root* in peptic ulcer; with *Taraxacum Leaf* in Addison's disease.

Preparations and Dosage: (thrice daily)

Powdered root. Dose 1-4 g or by decoction. Liquid Extract B.P. (1973). Dose 2-5 ml.

Note: *Glycyrrhiza* should be prescribed in neutral or alkaline solution. It is more effective when taken before food. Large doses over a prolonged period may result in hypokalaemia. The potassium intake should be increased.

GOSSYPIUM

SYNONYM

Cotton Root Bark.

DEFINITION

Gossypium is the dried root bark of *Gossypium herbaceum* L. and other species of *Gossypium* (Fam. Malvaceae) perennial plants indigenous to India and cultivated in India, Southern Europe and the United States. It contains a pale yellow or colourless resin which becomes red-brown and inert on exposure to air, a fixed oil, gossypol and catechol.

B.P.C. (1934), p.489.

DESCRIPTION

Macroscopical: The root bark occurs in long, thin, flexible and fibrous strips, often channelled or quilled and up to 30 cm long and 0.5-1 mm thick, with occasional attached rootlets. The outer surface is light cinnamon brown, longitudinally wrinkled with occasional small lenticels, the cork sometimes exfoliating and easily separated to reveal the paler cortex. The inner surface is buff to light brown with a silky sheen and is finely striated longitudinally. Fracture tough and fibrous. Odour distinct: taste astringent and acrid.

Microscopical: Light brown powder. Cork fragments composed of several layers of thin-walled cells; numerous fibres in groups, individual fibres up to 1 mm long with moderately thickened, strongly lignified walls and few pits; parenchymatous cells, some containing reddish brown resin, the remainder containing starch granules simple or compound with up to six or occasionally more components, 5-20 μm in diameter, or calcium oxalate cluster crystals, up to 30 μm in diameter.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 5%.

THERAPEUTICS

Action: Emmenagogue.

Indication: Functional amenorrhoea. Dysmenorrhoea.

Specific Indications: Atonic and congestive dysmenorrhoea.

Combinations Used: May be combined with Chamaelirium and Leonurus in atonic amenorrhoea: with Pulsatilla and Viburnum Prunifolium in dysmenorrhoea.

Preparations and Dosage: (thrice daily)

Liquid Extract. B.P.C. (1934). Dose 2-4 ml. Tincture. B.P.C. (1934). Dose 2-4 ml.

Note: Freshly collected root-bark is claimed to be oxytotic. Felter H.W. (1922) 395-6.

GRINDELIA

SYNONYMS

Grindelia Robusta; Gumplant; Gumweed; Tarweed.

DEFINITION

Grindelia consists of the dried aerial parts of *Grindelia camporum* Greene (Fam. Compositae) and perhaps other species of *Grindelia* gathered before the flowerheads expand. The plants are natives of western North America, herbs which secrete sticky resin, especially from the yellow compositous flowers.

Grindelia contains resin with unsaturated cyclic acids and saponins.

Martindale, 25th Edn., p. 691, B.P.C. (1949), p. 380-1.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments rigid and brittle, minutely reticulately pitted, some pieces showing a serrated margin, pale green or rose-brown. Some separate yellow ray florets about 10 mm long. Groups of yellow disc florets, about 5 mm long, with bristly pappus hairs. Loose pappus hairs. Portions of flat, circular, pale green receptacles, pitted with floret scars on the upper surface, with a margin of curved, stiff, resin covered, lanceolate bracts. Many stem pieces, perhaps split, pithy, faintly longitudinally striated, smooth, very pale green. Odour slightly balsamic.

Microscopical: Covering trichomes of the leaf uniseriate, of about 4 to 7 short cells, with a longer, narrow, terminal cell. Glandular trichomes, few on the leaf and situated on the edges of the reticulations, many on the bracts around the receptacles, broadly ovoid masses, multicellular, sessile, about 35 to 85 μm long, containing minute rosettes of calcium oxalate about 4 μm in diameter. Leaf epidermis with polygonal, beaded anticlinal walls, containing scattered birefringent crystals in small rosettes and needles. Stomata anomocytic, raised above the surface. Ray florets terminating in an acute apex. Disc florets tubular with a five-lobed corolla and five protruding stamen filaments the ends of which are intensely birefringent. All florets containing many small birefringent crystals on the lower half; rosettes just above the ovary, and prisms further up the corolla and around the ovary. Pappus hairs loose, each about half the length of the disc florets and about 90 to 110 μm wide, with the marginal cells overlapping outwards. Pollen grains compositous, spherical, with a shiny exine and 3 pores, about 30 μm in diameter.

U.S.D., 22nd Ed., p. 520-2.

Acid Insoluble Ash: Not more than 2%.

Extractive: Not less than 20% is yielded to 90% alcohol.

THERAPEUTICS

Action: Antispasmodic. Expectorant. Cardiac depressant.

Indications: Asthma and bronchitis. Upper respiratory catarrh. Whooping cough. Cystitis. Lotion in poison-ivy dermatitis.

Specific Indications: Bronchial asthma associated with tachycardia.

Combinations used: May be used with Lobelia and Glycyrrhiza in asthma and bronchitis.

Side Effects: Large doses are reported to cause renal irritation.

Preparations and Dosage: (thrice daily)

Dried aerial parts. Dose 2-3 g or by infusion. Liquid Extract (B.P.C. 1949) 1:1 in 22½% alcohol. Dose 0.6-1.2 ml. Lotion: Liquid Extract 1:10 in 10% alcohol. Tincture 1:10 in 60% alcohol. Dose 0.5-1 ml.

GUAIACUM

SYNONYMS

Lignum vitae; Guaiac; Guajacum.

DEFINITION

Guaiacum is the heartwood of *Guaiacum officinale* L. and *G. sanctum* L. (Fam. Zygophyllaceae), an evergreen tree indigenous to the West Indies, South America and Florida. Guaiacum contains a mixture of resin acids, α and β -guaiaconic acids, guaiaretic acid, guaiacic acid, vanillin, guaiaicasaponin, and a higher terpenoid guaiaгутtin.

B.P.C. (1949) p. 381. Martindale, 26th Edn., p. 313.

DESCRIPTION

Macroscopical: Greenish brown large irregular pieces of wood, dense and heavier than water, smooth transverse surface showing growth rings as alternating concentric bands traversed by fine, closely arranged medullary rays. Sometimes occurring in strips green-brown in colour. Yellowish sapwood should be absent. Odour aromatic when warmed; taste slightly acid.

Microscopical: Brown powder consisting of numerous thick-walled tortuous fibres; medullary rays one cell wide and three to six cells high; thick-walled vessels, 100-200 μ m in diameter, with numerous bordered pits; brown resin present in parenchyma and medullary ray cells; prisms of calcium oxalate.

Total Ash: Not more than 3%.

THERAPEUTICS

Action: Antirheumatic. Anti-inflammatory. Diuretic. Mildly laxative. Diaphoretic.

Indications: Rheumatoid arthritis. Sub-acute and chronic rheumatism. Gout, as a prophylactic.

Specific Indications: Chronic rheumatism. Rheumatoid arthritis.

Combinations used: May be combined with Zingiber, Menyanthes, Filipendula, Apium according to the indications.

Preparations and Dosage: (thrice daily)

Dried wood. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 80% alcohol. Dose 1-2 ml. Tincture (B.P.C. 1934) 1:5 in 90% alcohol. Dose 1-4 ml.

GUAREA

SYNONYMS

Cocillana; Grape Bark; Guapi Bark.

DEFINITION

Guarea is the dried bark of *Guarea rusbyi* (Britton) Rusby. (Fam. Meliaceae), a tree indigenous to the Eastern Andean slopes of Bolivia. Guarea contains an alkaloid, rusbyine, a glycoside, a mixture of resins, 2.5% of volatile oil, tannins and fixed oil.

B.P.C. (1973), p.122. Martindale 27th Edn., p.599.

DESCRIPTION

Macroscopical: Large flat or curved pieces of bark up to 60 cm long, 15 cm wide and 5-20 mm thick but normally cut smaller, grey-brown externally or red-brown where the cork has exfoliated; white patches of lichens; longitudinally fissured on the outer surface. Inner surface longitudinally striated, fibrous strands readily detached. Fracture short in the outer layers but fibrous in the inner part. Transverse surface exhibits narrow cork with a wide inner section darker in colour and transversed by narrow wavy medullary rays. Odour slight; taste astringent.

Microscopical: Light brown powder. Cork cells in layers of up to six, thin-walled, polygonal in surface view; sclereids, rectangular or elongated, thick pitted walls, sometimes containing yellowish pigment, occur occasionally singly but mainly in groups. Fibres straight, thick-walled with pointed ends, occur in groups together with phloem parenchyma and sieve tubes, each fibre group surrounded by a crystal sheath of calcium oxalate prisms 10-25 μ m long. Medullary rays containing pigment, lignified when associated with fibres; lignified parenchymatous cells containing prisms of calcium oxalate occasionally exhibited as twinned prisms. Starch grains, single and spheroidal, 5-20 μ m in diameter, sometimes 2-4 compound.

Jackson & Snowdon, p.18.

Total Ash: Not more than 9%.

Foreign Organic Matter: Not more than 5%.

Alcohol (60% soluble extractive): Not less than 3.5%.

THERAPEUTICS

Action: Expectorant. Emetic (large doses). Aperient.

Specific Indication: Chronic bronchitis.

Combinations Used: May be combined with Euphorbia, Senega, Grindelia and Marrubium in bronchitis.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 0.5-1 g or as decoction. Emetic dose 1.5-3 g. Liquid Extract. B.P.C. (1973). Dose 0.5-1 ml. Tincture. 1:10 in 60% alcohol. Dose 5-10 ml. Syrup Cocillan. Co. B.P.C. (1949). Dose 2-4 ml.

HAMAMELIS BARK

SYNONYMS

Witch Hazel Bark; Cortex Hamamelidis.

DEFINITION

Hamamelis Bark consists of dried bark of *Hamamelis virginiana* L. (Fam. Hamamelidaceae), a shrub growing in the United States of America and Canada. Hamamelis Bark contains about 6% of tannin, a part of which, hamamelitannin, is crystalline, and a part amorphous. Gallic acid is also present.

B.P.C. (1949) p. 387. Martindale 27th Edn., p. 218.

DESCRIPTION

Macroscopical: Thin channelled pieces, pink-brown in colour up to 15 cm long and 2 cm wide, but may be smaller; occasionally covered with ash grey cork which in older pieces becomes dark in colour, fissured and scaly. Inner surface pale pink and faintly striated longitudinally, sometimes with a small portion of white xylem adhering. Fracture short in the cortex and fibrous in the phloem. Transverse surface exhibits a narrow cortex, a pale line of sclereids and a phloem. Taste astringent and bitter.

Microscopical: A pale pink-buff powder; abundant lignified sclereids of two types, oval to sub-rectangular and heavily thickened, occurring in groups of two or three, walls with branched pits and striations and smaller and thin-walled sclereids often associated with cork cells. Frequent thick-walled lignified fibres surrounded by a sheath of calcium oxalate prisms; starch grains rare, small, spheroidal, often located in parenchymatous cells. Infrequent fragments of lignified xylem tissue consisting of narrow tracheids with bordered pits accompanied by thin-walled fibres and pitted medullary ray cells. Parenchyma of phloem thin walled often filled with dark brown contents; abundant fragments of polygonal cork cells.

Jackson & Snowdon, p. 34.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1.5%.

Thin-Layer Chromatography: As for Hamamelis Leaf.

THERAPEUTICS

Action: Astringent. Antihaemorrhagic. Anti-inflammatory.

Indications: Diarrhoea. Mucous colitis. Haemorrhoids. Locally. External haemorrhoids.

Specific Indication: Diarrhoea with haemorrhoids.

Combinations used: Combines with Ranunculus or Plantago Major in haemorrhoids; with Agrimonia and Quercus in diarrhoea.

Preparations and Dosage: (thrice daily)

Tincture B.P.C. (1934). Dose 2-4 ml. Used diluted as a mouthwash.

HAMAMELIS LEAF

SYNONYMS

Hamamelis Leaf; Witch Hazel Leaf.

DEFINITION

Hamamelis Leaf consists of the dried leaves of *Hamamelis virginiana* L. (Fam. Hamamelidaceae), a shrub growing in the United States of America and Canada. Hamamelis Leaf contains tannin, gallic acid, a bitter substance, and a trace of volatile oil.

B.P.C. (1973), p. 218. Martindale 27th Edn., p. 218.

DESCRIPTION

Macroscopical: Leaves dark greenish-brown, green on upper surface, lighter on the lower surface; 5-12 cm long, brittle and fibrous; broadly oval to rhomboid-ovate; petiole round, 1-2 cm long, margin coarsely crenate to sinuate, apex acute, base cordate and unequal and venation pinnate, lateral veins straight and running to the margin, prominent on the under surface. Odour not marked; taste bitter and astringent.

Microscopical: A dull greenish-brown powder consisting of fragments of leaf; lower epidermis, wavy anticlinal-walled cells, paracytic stomata and stellate trichomes; upper epidermis, less wavy-walled cells, stomata and trichomes absent; large prisms of calcium oxalate present in cells of the mesophyll or associated with groups of fibres; lignified branched idioblasts.

Jackson & Snowden, p. 78.

Total Ash: Not more than 7%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Content of Stalks: Not more than 3%.

Thin-Layer Chromatography: Janistyn, H. (1964) Parfum. Kosmetik., 45, 335.

THERAPEUTICS

Action: Antihaemorrhagic. Astringent. Anti-inflammatory.

Indications: Diarrhoea. Mucus colitis. Haematemesis. Haemoptysis. Haemorrhoids.

Locally. Bruises. Localised inflamed swellings. Haemorrhoids.

Specific Indications: Colitis. Haemorrhoids.

Combinations used: May be combined with Ranunculus or Plantago Major in haemorrhoids; with Agrimonia in colitis. Hamamelis Water B.P.C. combines with Calendula as a lotion for localised inflammation.

Preparations and Dosage: (thrice daily)

Dried leaf. Dose 2 g or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 2-4 ml. Hamamelis Water B.P.C. for local application.

HARPAGOPHYTUM

SYNONYMS

Devil's Claw.

DEFINITION

Harpagophytum is the cut, dried tuber of *Harpagophytum procumbens* D.C. (Fam. Pedaliaceae), a plant indigenous to Southern and Eastern Africa. It bears a characteristic large, hooked, claw-like fruit. Harpagophytum contains the iridoid glycosides harpagide and harpagoside, and procumbide.

DESCRIPTION

Macroscopical: Transversely cut discs of tuber, with some fan-shaped pieces, up to 6 cm in diameter and about 0.5 cm thick. Bark yellow to dark brown with longitudinal striations. Xylem radiate, heavily concentric, light grey-brown, occasionally with cavities. Fracture short. Odour slight; taste astringent, bitter.

Microscopical: Powder light brown. Abundant lignified pitted parenchyma, associated with vessels. Vessels reticulately thickened, some with rounded perforations in the end walls. Abundant thin-walled parenchyma; cork cells large, thin-walled with brown contents. Fibres and sclereids absent; calcium oxalate absent; very little or no starch.

Test: Treatment with phloroglucinol and concentrated hydrochloric acid produces a dark green colour.

Chromatography: Tunmann, P., Lux. R., (1962) Deut. Apoth. Z., 102, 1274.

THERAPEUTICS

Action: Anti-inflammatory. Anti-rheumatic. Analgesic. Sedative. Diuretic.

Indications: Rheumatism. Arthritis. Gout. Myalgia. Fibrositis. Lumbago. Pleurodynia.

Specific Indications: Rheumatic disease.

Combinations Used: Combines with Menyanthes, Apium, Gaultheria and Dioscorea in rheumatism.

Preparations and Dosage: (thrice daily)

Dried tuber. Dose 0.10-0.25 g. Liquid Extract. 1:1 in 25% alcohol. Dose 0.10-0.25 ml. Tincture. 1:5 in 25% alcohol. Dose 0.5-1 ml.

HUMULUS

SYNONYMS

Hops; Lupulus.

DEFINITION

Humulus consists of the dried strobiles of *Humulus lupulus* L. (Fam. Cannabinaceae) collected from the female plant. The plant is a native British dioecious climbing herb, 3-6 m tall.

Humulus contains volatile oil consisting chiefly of humulene, bitter principles and tannins.

Martindale, 25th Edn., p. 618. B.P.C. (1923), p. 637. B.P.C. (1934), p. 610-1. B.P.C. (1949), p. 1456. B.P. (1889), p. 208.

DESCRIPTION OF STROBILES

Macroscopical: Yellowish-green ovoid cone-like compound fruits 3-4 cm long consisting largely of stipules and bracteoles. Stipules are flat obovate and symmetrical, 10 by 5 mm to 20 by 10 mm; bracteoles are folded along one margin with a small fruit at the base of the fold and are ovate and markedly asymmetrical, 15 by 7 mm to 30 by 10 mm. The fruits and bracteoles are covered by glistening yellow bands. Odour aromatic; taste bitter.

Microscopical: Numerous large glands, 100-250 μ m in diameter, each composed of a number of thin walled cells arranged in a single hemispherical layer with a common raised cuticle forming a dome. Yellowish-brown oleoresin in the space between cells and cuticle. Each gland has a short stalk of 2-4 small cells. Epidermal cells of bracteoles and stipules are irregularly polygonal with sinuous walls, usually thin, occasionally slightly beaded and thickened; anisocytic stomata occur rarely; occasional irregular cicatrices with unicellular pointed trichomes. Bracteoles and stipules have undifferentiated mesophyll of thin walled cells containing small cluster crystals of calcium oxalate.

U.S.D., 22nd Ed., p. 531. Jackson & Snowdon, p. 58-9.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 5%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 13%.

Thin Layer Chromatography: Kurosiwa & Ashimoto (1961) J. Inst. Brewing, 67, 347.

THERAPEUTICS

Action: Sedative. Hypnotic. Topically bactericidal.

Indications: Neuralgia. Insomnia. Excitability. Priapism. Mucous colitis. Topically — Crural ulcers.

Specific Indications: Restlessness associated with nervous tension headache and/or indigestion.

Combinations used: Combines well with Valeriana as hypnotic and with Chamaemelum for nervous dyspepsia.

Contra-indications: Inadvisable in depression.

Preparations and Dosage:

Dried strobile. Dose 0.5-1 g: as hypnotic; 1-2 g; or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 0.5-2 ml. Tincture 1:5 in 60% alcohol. Dose 1-2 ml.

HYDRANGEA

SYNONYMS

Seven Barks.

DEFINITION

Hydrangea consists of the dried underground parts of *Hydrangea arborescens* L. (Fam. Saxifragaceae). The plant is a shrub native to central and southern United States. Hydrangea contains the glucoside hydrangin, saponins and resins.

DESCRIPTION OF CUT ROOT AND RHIZOME

Macroscopical: Pale yellow woody chips of rhizome up to 1 by 2 cm, with thin brown cork often separated from rhizome. Short lengths, 2 to 3 cms, of very thin fibrous roots. Taste bitter.

Microscopical: Powder yellowish brown. Abundant simple spherical starch grains, occasionally with a predominant central cleft, ranging from 4 to 12 μm in diameter. Much lignified tissue; thick pitted-walled parenchyma from medullary rays; xylem tissue of groups of tracheids with pitted walls and, mainly, groups of vessels with reticulate thickening; occasional sclereids and groups of fibres with narrow lumens and thick walls with simple and branching pits. Non-lignified thin-walled polygonal cork cells with brown contents. Numerous calcium oxalate needles from 50 to 140 μm in length, scattered and in idioblasts.

Total Ash: Not more than 5%.

THERAPEUTICS

Action: Diuretic. Antilithic.

Indications: Cystitis. Urethritis. Urinary calculi. Prostatitis and enlarged prostate gland.

Specific Indications: Urinary calculi with gravel and cystitis.

Combinations used: Combines well with Aphanes, Arctostaphylos and Eupatorium Purpureum for renal and vesicular calculi.

Preparations and Dosage: (thrice daily)

Dried root and rhizome. Dose 2-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-10 ml.

HYDRASTIS

SYNONYMS

Yellow Root; Golden Seal; Hydrastis Rhizome.

DEFINITION

Hydrastis consists of the dried rhizome and roots of *Hydrastis canadensis* L. (Fam. Ranunculaceae), a small perennial plant growing in the Eastern United States and Canada. It is collected in the autumn. Hydrastis contains the three alkaloids hydrastine, berberine and canadine. Hydrastine and berberine are the predominant constituents forming 4-5% of the drug.

Martindale, 26th Edn., p. 2018, B.P.C. (1934), p. 534. Merck Index, 7th Edn., p. 528.

DESCRIPTION

Macroscopical: Yellow-brown tortuous rhizomes, 2-5 cm long and 4-10 mm thick, wrinkled longitudinally and circled by scale leaf scars. All parts of the surface bear numerous brittle, curved roots sometimes broken to leave yellow root-scars. They also bear upright branches terminated by cup-shaped scars left by the aerial stems. The fracture is brittle and the cut surface dark yellow; it exhibits a thick bark and a ring of 10-20 yellow wood bundles, surrounding a large pith. Odour distinctive; taste bitter.

Microscopical: The powder is dark yellow, containing abundant small, simple starch grains, a few compound granules, large oval parenchymatous cells packed with starch and a few irregular brown resin cells; polygonal cork cells, brown or nearly black; occasional fragments of the piliferous layer from the young roots showing root hairs. Vessels narrow, pitted and sometimes with reticulate thickening, occur in groups. Fibres are infrequent, thin walled, lignified and pitted.

Jackson & Snowdon, p. 156.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 12%.

Paper Chromatography: Wisniewski, W. and Gorta, T. (1966), Acta. Pol. Pharm. 23, 455-8.

Thin Layer Chromatography: Netren, G. and Graviou, E. (1968), Bull. Trav. Soc. Pharm. Lyon. 12, 13-24. Kamp, W., Ontenberg, W.J.M. and Vanseters, W.A. (1963), Pharm. Weekblad., 98, 993-1007.

THERAPEUTICS

Action: Stimulant to involuntary muscle. Stomachic. Oxytocic. Antihæmorrhagic. Laxative.

Indications: Digestive disorders, gastritis, peptic ulceration, colitis. Anorexia. Upper respiratory catarrh. Menorrhagia. Post-partum hæmorrhage. Dysmenorrhoea. Topically – Eczema. Pruritus. Otorrhoea. Catarrhal deafness and tinnitus. Conjunctivitis.

Specific Indications: Atonic dyspepsia with hepatic symptoms.

Combinations used: Combines well with Filipendula and Chamaemelum in stomach conditions. May be used with Trillium in uterine hæmorrhage. Topically – with Passiflora and Hamamelis Leaf in pruritus; with Commiphora Resin, Echinacea, Verbascum and *Eucalyptus globulus* as ear drops; with Hamamelis Leaf and Euphrasia as eye lotion.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 0.5-1 g or by decoction. Liquid Extract (B.P.C. 1949) 1:1 in 60% alcohol. Dose 0.3-1.0 ml. Tincture (B.P.C. 1949) 1:10 in 60% alcohol. Dose 2-4 ml.

Note: Avoid in pregnancy and hypertensive conditions.

HYPERICUM

SYNONYM

Common St. John's Wort.

DEFINITION

Hypericum consists of the dried aerial parts of *Hypericum perforatum* L. (Fam. Hypericaceae) gathered during the flowering period or shortly before. The plant is a native British herb up to 90 cm tall, upright, branching with opposite, oblong, entire, sessile leaves exhibiting numerous pellucid dots, and bearing heads of bright yellow five-petalled flowers with numerous stamens.

Hypericum contains red hypericin, astringents, flavonoids and a volatile oil. Martindale, 25th Edn., p. 1528.

DESCRIPTION OF CUT HERB

Macroscopical: Mainly green fragments of the glabrous leaves containing oil glands visible as transparent areas, with small black dots on some lower surfaces. Groups of flower buds with yellow petals enclosed by lanceolate, green sepals, all finely black-dotted. Stem pieces cylindrical, hollow, faintly two-ribbed on opposite sides, pale green. Odour distinct; taste astringent.

Microscopical: Leaf epidermal cells with sinuous anticlinal walls, those of the upper surface being beaded. Stomata anomocytic, in the lower epidermis only. Trichomes and calcium oxalate crystals absent. The mesophyll contains clear schizogenous oil glands and dark hypericin glands which yield a red pigment, especially at the leaf margins and on the flower parts, including the anthers. Pollen grains ellipsoidal, with a smooth exine and 3 pores, about 20-25 μm in diameter.

Deryng p. 234-6.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2.5%.

Paper Chromatography: Mathis & Ourisson (1963) Phytochem. 2 157. Burchfield & Prill (1959) Contrib. Boyce Thompson Inst. Pl. Res 20 251.

THERAPEUTICS

Action: Sedative. Astringent.

Topically: Analgesic, Antiseptic.

Indications: Excitability. Neuralgia. Fibrositis. Sciatica.

Topically: Wounds.

Specific Indications: Menopausal neurosis.

Combinations used: May be combined with Hamamelis Water as lotion for contusions and as an application to haemorrhoids. Mouthwash with Calendula in parodontitis. May be combined with Calendula as a lotion for contusions.

Contra-indications: Depressive states.

Toxicity: Reported to cause photosensitisation in cattle and sheep. (Kreitmair (1950), Pharmazie 5, 556. Pace & Mackinney (1941), J. Amer. Chem. Soc. 63, 2570).

Preparations and Dosage (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:10 in 45% alcohol. Dose 2-4 ml.

HYSSOPUS

SYNONYM

Hyssop.

DEFINITION

Hyssopus consists of the dried aerial parts of *Hyssopus officinalis* L. (Fam. Labiatae) gathered during the flowering period. The plant is a herb native to Southern Europe, upright, up to 60 cm tall, scented, with lanceolate leaves, bearing spikes of blue-violet flowers.

Hyssopus contains a volatile oil and flavonoid glycosides, including diosmin. Martindale, 25th Edn., p. 1528.

DESCRIPTION OF CUT HERB

Macroscopical: Pieces of rough, green rolled up leaves, up to 2.5 cm long, with entire margins. Many green-violet calyces, conical, with 5 teeth, slightly longer than 5 mm, some containing shrivelled blue petals. Mainly stem pieces, four-sided, light green. Odour and taste camphoraceous.

Microscopical: Covering trichomes all bent, pointed, warty, uniseriate, of 1 to 6 cells. Glandular trichomes of labiate type, with unicellular stalks and either large, round heads of 8 cells or small uni- or bi-cellular heads. Leaf epidermal cells with sinuous or straight anticlinal walls, containing spherical crystals of flavonoid glycoside, and with a slightly striated cuticle. Stomata diacytic, surrounded by the 2 subsidiary cells. Calcium oxalate absent. Pollen grains elongated spheres, about 40 µm by 30 µm in diameter, with finely granular exine and 6 furrows.

Deryng., p. 238-41.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2.5%.

Water Soluble Extractive: Not less than 10%.

Content of Volatile Oil: Not less than 0.25%.

THERAPEUTICS

Action: Expectorant. Diaphoretic. Sedative. Carminative.

Indications: Bronchitis. Chronic nasal catarrh. Has been used in hysteria, anxiety states and petit mal.

Specific Indications: Bronchitis and the common cold.

Combinations used: Given with Marrubium for bronchial catarrh or with flowers of Calendula in childhood fevers.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

ILEX

SYNONYMS

Maté, Yerba Maté, Paraguay Tea, Jesuit's Brazil Tea, St. Bartholomew's Tea.

DEFINITION

Ilex consists of the dried leaves of *Ilex paraguariensis* St. Hil. (Fam. Aquifoliaceae), indigenous to Brazil and Argentina. Ilex contains volatile oil, other terpenes, 0.2-2.0% of caffeine, mateviridic acid and up to 16% tannin. B.P.C. (1934), p. 1048. Martindale 27th Edn., p. 283. Merck Index 9th Edn., 5584.

DESCRIPTION

Macroscopical: Coarsely ground, green-brown coriaceous leaf. Taste bitter and astringent; odour slightly aromatic.

Microscopical: Dark green powder; dorsiventral leaf; upper epidermis with thick-walled polygonal cells and very thick striated cuticle; several rows, usually two, of palisade mesophyll; lower epidermis with thin-walled polygonal cells and anomocytic stomata with lignified guard cells; spongy mesophyll stellate and relatively thick-walled; fine spiral lignified vessels; mid-rib and larger veins with lignified pericyclic fibres; very few unicellular conical covering trichomes found above main veins; numerous clusters up to 30 μ m diameter and few prisms of calcium oxalate particularly in palisade mesophyll and above main veins; abundant oil globules in cells of the mesophyll; many cells with red-brown contents.

Moisture Content: Not more than 10%.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Water Soluble Extractive: Not less than 20%.

Thin-Layer Chromatography: Schunack, W., Mutschler, E. and Rochelmeyer, H. (1965) Dtsch. Apoth. Ztg., 105, 1551.

THERAPEUTICS

Action: Stimulant to the central nervous system. Thymoleptic. Diuretic. Antirheumatic. Mildly analgesic.

Indications: Psychogenic headache and fatigue; nervous depression. Rheumatic pains.

Specific Indication: Headache associated with fatigue.

Preparations and Dosage: (thrice daily)

Dried leaves. 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

INULA

SYNONYM

Elecampane Root.

DEFINITION

Inula is the dried roots and rhizomes of *Inula helenium* L. (Fam. Compositae), a large perennial herb, indigenous to central Europe and Asia. The rhizomes are collected in the spring and autumn. *Inula* contains 40% inulin and yields on distillation 1-2% of a crystalline mass containing alantolactone, isoalantolactone and alantolic acid, associated with alantol, an oily liquid with a peppermint-like odour; mucilage is also present.

Martindale, 25th Edn., p. 1522. Merck Index, 7th Edn., p. 935.

DESCRIPTION

Macroscopical: Irregular dark brown pieces 2 to 8 cm long and 0.5 to 2.0 cm wide, longitudinally wrinkled and sometimes curved and twisted. Rhizomes are tapering, the crown being somewhat annulate and surmounted by a stem scar; short roots or root scars are frequent. Often the cork is abraded showing a greyish cortex. The fracture is short and horny, internally light brown, showing a distinct cambium and numerous brown resin cells in the xylem and phloem. Odour aromatic and pleasant; taste initially sweet but later pungent.

Microscopical: The powder is light brown and consists of large parenchymatous cells containing irregular granules of inulin. Fragments of yellow-brown resin are common, the vessels are lignified, reticulately thickened or occasionally bordered pitted. Lignified xylem fibres with a few simple pits, fragments of brown cork cells, epithelial cells and fragments of resin cells are also present.

Deryng, p. 58.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1%.

Water Soluble Extractive: Not less than 30%.

THERAPEUTICS

Action: Expectorant. Antitussive. Diaphoretic. Bactericidal.

Indications: Bronchial or tracheal catarrh. Cough of pulmonary tuberculosis. Irritating cough in children.

Specific Indications: Irritating cough of bronchitis. Phthisis.

Combinations used: Combines well with Marrubium, Tussilago, Asclepias and Millefolium.

Preparations and Dosage (thrice daily)

Dried root. Dose 1.5-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1.5-4 ml.

IRIS FLORENTINA

SYNONYMS

Orris; Orris Root.

DEFINITION

Iris Florentina is the dried rhizome of *Iris florentina* L., *Iris germanica* L. and *Iris pallida* Lam. (Fam. Iridaceae), which are cultivated in Italy but grown as ornamentals in many parts of Europe. The rhizomes are collected in the late summer or early autumn, freed from roots, carefully peeled and slowly dried. Iris contains 0.1-2% of a volatile substance known as concrete oil of orris or orris butter, which is composed of 85% myristic acid, the remaining portion being composed of irone ($C_{14}H_{22}O$), ionone, oleic acid, methyl myristate and other esters. The rhizome contains, in addition, a glycoside, starch, sugar and resin.

B.P.C. (1949), p.452. Martindale 27th Edn., p.1023.

DESCRIPTION

Macroscopic: Hard pieces of rhizome up to about 10 cm long, 3 cm wide and 2 cm thick, pale cream in colour, often dorsiventrally flattened and constricted at intervals, bearing one or two short lateral branches at the apex; under surface bearing numerous brown circular root scars and the upper surface indistinct leaf scars. The surface shows flattish areas and ridges due to peeling with a knife. Fracture short, the smooth transverse surface showing narrow cortex, brown endodermis and a large stele with scattered vascular bundles. Odour reminiscent of violets; taste aromatic, somewhat bitter.

Microscopic: A cream-white powder. Starch abundant, grains mostly simple up to 30 μm long and 25 μm wide, angular-ovoid or truncate with a radiate hilum. Characteristic elongated prisms of calcium oxalate about 250 μm long and 30 μm wide with oblique or chisel-shaped ends. Fragments of thick-walled pitted parenchyma, polygonal in outline. Vessels lignified, usually occurring in groups with spiral, annular and sometimes reticulate thickening. Fibres and sclerenchyma absent.

Jackson & Snowdon, p.174.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Should not be present.

Water Soluble Extractive: Not less than 20%.

THERAPEUTICS

Action: Demulcent. Aromatic. Expectorant. Antidiarrhoeal.

Indications: Formerly used in upper respiratory catarrh. Cough. Diarrhoea in infants.

Preparations: (thrice daily)

Dose. Dried root 200 mg-1 g as infusion.

Used as an ingredient in toilet and dental preparations, and in cachous for halitosis.

IRIS VERSICOLOR

SYNONYM

Blue Flag.

DEFINITION

Iris Versicolor is the dried rhizome of *Iris versicolor* L. and *I. caroliniana* Watson (Fam. Iridaceae), an herbaceous plant growing in swampy places in Eastern and Central North America. Rhizomes are freed of scaly decayed leaves and roots and dried. Iris Versicolor contains 2.5% of acrid resins including isophthalic acid and salicylic acid, a small quantity of volatile oil and an alkaloid. B.P.C. (1934), p.563.

DESCRIPTION

Macroscopical: Cylindrical rhizome, more or less flattened and occasionally branched; outer surface annulate with numerous stem scars on the upper surface, and root scars on the lateral and lower portions. May be cut lengthwise into pieces 2-20 cm long and 5-22 mm wide. Externally grey-brown and occasionally with fibrous bases of decayed leaves and short stout roots attached. Fracture short, resinous, internally red-brown with a yellowish endodermis containing scattered white vascular bundles. Odour slight and aromatic; taste sweet and slightly acrid.

Microscopical: Red-brown powder; numerous fragments of parenchyma associated with resin cells; calcium oxalate in long solitary prisms with pyramidal ends 200-350 μ m in length; parenchyma cells sometimes contain amylo-dextrin grains which colour red with iodine solution; and occasional ovoid starch grains. Vessels with spiral or reticulate thickening.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Content of Stalks: Not more than 5%.

THERAPEUTICS

Action: Cholagogue. Laxative. Diuretic. Dermatological agent. Anti-inflammatory. Antemetic in small doses.

Indications: Skin diseases. Biliousness with constipation and liver dysfunction.

Specific Indication: Cutaneous eruptions.

Combinations used: Combines with Rumex Crispus, Trifolium, Phytolacca, and Stillingia in skin disease.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 0.6-2 g or by decoction. Liquid Extract 1:1 in 45% alcohol. Dose 1-2 ml.

JACOBAEA

SYNONYM

Common Ragwort; St. James's Wort.

DEFINITION

Jacobaea consists of the dried aerial parts of *Senecio jacobaea* L. (Fam. Compositae) gathered during the flowering period. The plant is a native British herb, 30-150 cm tall, upright with deeply pinnately lobed leaves and bearing numerous dense heads of yellow compositous flowers, 15-20 mm in diameter with 12-15 ray florets.

Jacobaea contains alkaloids including jacobine, jaconine and jacobine, and flavonoid glycosides.

DESCRIPTION OF CUT HERB

Macroscopical: Dark green curled fragments of the pinnate leaves. Disc florets enclosed by brown bracts. Stem pieces, light green to yellow, ribbed and hollow. The many loose pappus hairs give the cut herb a "feathery" appearance. Taste slightly bitter.

Microscopical: Glandular trichomes, compositous, multicellular. Covering trichomes absent. Leaf epidermal cells with sinuous beaded anticlinal walls. Stomata anisocytic. Crystal layer of rosettes, up to 44 μm in diameter, together with scattered microrosettes in the mesophyll. Disc florets tubular, with a five-lobed corolla, containing five stamen filaments the ends of which are intensely birefringent. Florets contain very small calcium oxalate crystals in the lower half, rosettes just above the ovary and prisms further up the corolla. Pappus hairs about as long as the disc florets and about 24-32 μm wide with marginal hairs overlapping outward. Pollen grains compositous, spherical, with a spiny exine and 3 pores about 28 μm in diameter.

Paper Chromatography: Bradbuty & Masamume (1959), J. Am. Chem. Soc., 81 5201. U.S.D. 22nd Edn., p. 1568.

THERAPEUTICS

Action: Antirheumatic.

Indications: Topically — as application in arthritis, myalgia and sciatica after consultation.

Specific Indications: Rheumatoid arthritis. Non-articular rheumatism.

Combinations used: As a lotion for application in arthritis or myalgia, may be combined with Gaultheria and Lobelia.

Preparation:

Lotion — 1 in 10 w/v in 10% alcohol.

Note: the pyrrolizidine alkaloids are hepatotoxic in mammals. (Schoental R. (1968) Cancer Res., 28, 2237).

JATEORHIZA

SYNONYMS

Calumba Root; Colombo Root.

DEFINITION

Jateorhiza consists of the dried slices of the root of *Jateorhiza palmata* (Lam.) Miers (Fam. Menispermaceae), a climbing plant indigenous to East Africa. Jateorhiza contains alkaloids of the berberine type, including jateorrhizine, columbamine and palmatine, together with bitter principles, starch and a small amount of volatile oil. Tannin is absent.

B.P.C. (1954), p.136. Martindale 27th Edn., p.254.

DESCRIPTION

Macroscopical: Transverse slices, irregular, circular to oval, depressed in centre, 2-8 cm in diameter and 3-12 mm thick, commercial drug often consisting of small chopped pieces of root. Infer surface yellow to yellow-brown with a grey-brown wrinkled cork. The transverse cut surface exhibits a dark cambium separating a yellow outer region transversed by sinuous narrow phloem strands and a grey inner region with radiating lines of yellowish xylem vessels. Fracture short. Odour slight; taste bitter. Transverse surface gives green colour when treated with 66% sulphuric acid.

Microscopical: Yellow-brown powder. Dark brown fragments composed of polygonal thin-walled cork cells. Sclereids greenish-yellow usually in groups, irregular or rectangular and of various sizes, frequently containing calcium oxalate prisms about 30 μ m long, walls unevenly thickened with irregularly arranged pits, occasionally striated. Fragments of lignified vessels, large, reticulately thickened or bordered pitted with greenish-yellow walls. Parenchyma, irregular ovoid cells, thin-walled and containing elliptical or elongated starch grains, simple or 2-6 compound, from 25-100 μ m in length. Jackson and Snowdon, p.142.

Acid Insoluble Ash: Not more than 2.0%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

Chromatography: Vanhaelen, M. (1970). J. Pharm. Belg., 25: 175-212.

THERAPEUTICS

Action: Orexigenic. Carminative.

Indications: Anorexia. Hypochlorhydria. Atonic dyspepsia. Flatulence.

Specific Indication: Anorexia and flatulent dyspepsia.

Combinations Used: May be combined with Chelone, Gentiana or Picrasma in anorexia; with Acorus and Alpinia in intestinal flatulence.

Preparations and Dosage: (thrice daily)

Dried root, as decoction. Dose 0.5-1 g. Liquid Extract. 1:1 in 25% alcohol. Dose 0.5-1 ml. Tincture B.P. (1948). Dose 2-4 ml. Concentrated Infusion (B.P. 1948). Dose 2-4 ml.

JUGLANS

SYNONYMS

Butternut Bark; White Walnut; Lemon Walnut.

DEFINITION

Juglans consists of the dried bark of *Juglans cinerea* L. (Fam. Juglandaceae) a tree indigenous to North America. It contains juglone (5-hydroxy-1, 4-naphthoquinone), juglandic acid and large amounts of fixed and volatile oil and tannin.

Merck Index 9th Edn., 5118.

DESCRIPTION

Macroscopical: Occurs as curved or flat pieces, or chips of bark, up to 2 cm in thickness; outer surface sometimes bearing epiphytes, inner surface smooth and dark brown to black, thicker pieces exhibiting, in transverse section, three distinct regions; an outer dark-brown corky layer, an inner fibrous dark-brown to black layer and a middle brown-green layer transversed by thin dark brown layers; fracture of outer layer short and of inner layers fibrous. Odour rancid; taste bitter and acrid.

Microscopical: Dark-brown powder; abundant calcium oxalate clusters/rosettes 12 to 25 to 60 μm in diameter in parenchyma cells, medullary ray cells and forming a partial crystal sheath around the phloem fibres, very few prism crystals; starch grains few, 3-15 μm in diameter; small lumen fibres from the inner bark not heavily lignified; non-lignified and lignified parenchyma present, the latter found in the middle and outer bark layers only; reticulate sieve tubes with no companion cells found in the inner and middle layers of the bark together with multiseriate medullary rays; occasional groups of stone cells from the middle bark layer with lignified small lumen fibres 17-25 μm wide which are also present in the outer bark layer; parenchyma of the inner surface and outer layers of bark and cork with brown cell contents; cell contents give a purplish-red colour with alkali; fixed oil present especially in the medullary rays.

Total Ash: Not more than 7%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Mild cathartic. Cholagogue. Dermatological agent.

Indications: Constipation. Hepatic dysfunction. Exudative skin eruptions.

Specific Indications: Chronic constipation associated with dyspepsia.

Combinations used: It may be combined with Berberis and Taraxacum in mild constipation and with Rhamnus if necessary. Combines with Rumex Crispus, and Lappa Root in cutaneous disorders: with Ranunculus in haemorrhoids.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 2-6 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-6 ml.

JUNIPERUS

SYNONYM

Juniper.

DEFINITION

Juniper is the dried ripe fruit of *Juniperus communis* L. (Fam. Pinaceae), an evergreen shrub or small tree indigenous to Europe, Asia and North America. Juniper contains 0.5-2.0% of volatile oil, 10% resin and 33% sugar, a bitter substance juniperin and organic acids.

Martindale, 26th Edn., p. 1242. B.P.C. (1934) p. 569.

DESCRIPTION

Macroscopical: Globular fruits 5-8 mm in diameter, externally smooth, shiny, dark purple with a grey, waxy bloom. At the apex is a three rayed furrow where the fleshy scales meet, and at the top of each scale is a brown corky projection. At the base there are two whorls of yellow bracts, each of three members. Transverse section shows numerous large schizogenous cavities in the flesh of the bract and three triangular ovate seeds with a hard woody testa to which large oil glands are attached. Odour aromatic; taste sweet.

Microscopical: Powder red-brown consisting of polygonal cells of the bract epidermis containing brown glandular contents, outer epidermis has thickened pitted walls. Large parenchymatous cells of the bract mesophyll with fragments of oil glands and yellow resin masses; fibro-vascular bundles consisting of tracheids and fibrous cells; lignified sclereids of the seed coat up to 0.15 mm with thick irregular walls. Sclereids contain prisms of calcium oxalate. Large parenchymatous cells of endosperm containing aleurone grains.

Deryng, p. 304. Flück, p. 211.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 0.5%.

Gas-Liquid Chromatography: Vasek, F.C. and Scora, R.W. (1967), Amer. J. Bot., 54, 781-9.

THERAPEUTICS

Action: Diuretic. Antiseptic. Carminative. Stomachic. Antirheumatic.

Indications: Acute or chronic cystitis. Flatulent colic. 'Rheumatism'. Topically — rheumatic pain in joints or muscles.

Specific Indication: Cystitis, in absence of renal inflammation.

Combinations used: Combines well with Aphanes in cystitis.

Preparations and Dosage: (thrice daily)

Dried ripe fruits: Infusion 1:20 in boiling water. Dose 100 ml. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

Note: Avoid in renal disease and in pregnancy.

KRAMERIA

SYNONYMS

Rhatany Root; Peruvian Rhatany; Krameria Root.

DEFINITION

Krameria consists of the dried root of *Krameria triandra* Ruiz and Pavon (Fam. Krameriaceae), a shrub which grows on the barren mountain slopes of Peru and Bolivia. Krameria contains about 8% of krameria-tannic acid, together with a red phlobaphene produced by decomposition of the tannin. B.P.C. (1954), p.403. Martindale 27th Edn., p.218.

DESCRIPTION

Macroscopical: Dark brown-red with a knotty crown bearing nearly straight or somewhat tortuous roots; young bark has a smooth appearance with sharp transverse fissures, old bark has a scaly and rugged appearance. Fracture, fibrous in the bark and splintery in the wood. Transverse cut surface, dark brown-red bark occupying nearly one third of the radius, a dense pale red-brown finely porous wood transversed by fine medullary rays, often shows a central darker heartwood. Odourless; taste, bark astringent but wood tasteless.

Microscopical: Red-brown powder. Thin-walled cork cells containing dark brown contents; tortuous non-lignified fibres 12-30 μm wide and up to 1000 μm long, accompanied by files of parenchyma cells containing prisms of calcium oxalate crystals 2-30 μm wide or occasionally microcrystals; fragments of lignified vessels and fibre tracheids with bordered pits. Starch granules, simple and compound, usually rounded with a stellate hilum, 4-50 μm in diameter. Numerous brown-red tannin masses which turn brown-green when treated with a 10% ferric chloride solution.

Identification reactions:

1. Macerate 0.1 g of the powder with 10 ml of water for 1 hour. To the filtrate add 2 ml of 10% solution of ferrous ammonium sulphate. The liquid becomes cloudy but on standing a grey-green colour develops in the supernatant liquid.
2. Macerate 0.5 g of powder with ethanol (95%) for 2 hours. Dilute 1 ml of the filtrate to 100 ml with alcohol and add 0.1 ml of 10% alcoholic solution of ferric chloride. The liquid turns green.

Total Ash: Not more than 6.0%.

Foreign Matter: Not more than 2% of foreign matter and not more than 5% of crown or root exceeding 25 mm in diameter. Roots without bark should only be present in small quantities.

Alcohol (60%) extractive: Not less than 25%.

THERAPEUTICS

Action: Astringent. Antidiarrhoeal. Antihaemorrhagic.
Topically: Styptic. Vulnerary.

Indications: Diarrhoea. Menorrhagia. Gingivitis. Pharyngitis (as gargle or mouth wash).

Topically: Haemorrhoids (as suppository or ointment). Chilblain (paint). Wounds.

Specific Indications: Chronic diarrhoea. Pharyngitis. Prolapsed or bleeding haemorrhoids.

Combinations Used: May be combined with *Quercus*, *Potentilla* or *Geranium* in chronic diarrhoea; with *Trillium* in menorrhagia; with *Baptisia*, *Commiphora Resin* and *Salvia* in inflamed states of gums, mouth or throat as a mouth-wash; with *Hamamelis Bark* as suppository in haemorrhoids.

Preparations and Dosage: (thrice daily)

Dried root. Dose 0.5-2 g as decoction. Liquid Extract B.P.C. (1923). Dose 2-4 ml. Tincture *Krameria* B.P.C. (1949). Dose 2-4 ml. Concentrated Infusion B.P.C. (1949). Dose 2-4 ml.

LACTUCA

SYNONYM

Wild Lettuce.

DEFINITION

Lactuca consists of the dried leaves of *Lactuca virosa* L. (Fam. Compositae), a biennial plant indigenous to Europe and Northern Asia, cultivated in Britain and Europe. The fresh plant when cut exudes a latex known as lactucarium containing lactucone, lactucin and lactucic acid. The leaves contain in addition traces of a mydriatic alkaloid.

B.P.C. (1934), p. 584. Martindale, 25th Edn., p. 1531.

DESCRIPTION

Macroscopical: Consists of dried, much broken leaf pieces, 2-10 cm long, 1-3 cm wide, dark green or brown in colour, sessile, oblong, ovate, coarsely toothed, bearing bristles on the under surface of the midrib.

Microscopical: A dark green powder consisting of leaf fragments. Epidermal cells wavy walled, elongated over the veins, anomocytic stomata frequent on the upper surface, trichomes infrequent, mainly near large veins, unicellular warty covering trichomes and more frequent large multicellular lignified trichomes of midrib. Veins consist of annular vessels, thin fibres and narrow latex vessels.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 3%.

Paper Chromatography: Tronchet, J. (1961), Ann. Sci. Univ. Bescancon, Botan. (2) No. 17, 83.

THERAPEUTICS

Action: Mild sedative. Anodyne. Hypnotic.

Indications: Insomnia. Restlessness and excitability in children. Pertussis. Irritable cough. Priapism. Dysmenorrhoea. Nymphomania. Muscular or articular pains.

Specific Indications: Irritable cough. Insomnia.

Combinations used: Combines well with *Prunus* in irritable coughs: with *Humulus*, *Scutellaria*, *Cypripedium* and *Passiflora* in insomnia and with *Dioscorea* and *Cimicifuga* for rheumatic pains.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 0.5-3 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-3 ml.

LAPPA HERB

SYNONYMS

Burdock Herb; Bardane Herb.

DEFINITION

Lappa Herb consists of the dried aerial parts of *Arctium lappa* L. (Fam. Compositae) gathered in the first year of growth. The plants are native British herbs, with long petioles, biennial, with somewhat woolly cordate ovate leaves up to 40 cm long, in the second year up to 130 cm tall bearing heads of purplish compositous flowers of tubular florets only, with stiff hook-tipped bracts.

Lappa Herb contains flavonoids.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments light, fluffy and clinging in masses, the two surfaces being different shades of green. Petiole pieces mostly hollow, thin-walled, collapsed, heavily furrowed longitudinally, pale buff-brown. Taste bitter.

Microscopical: Covering trichomes of 2 types; many long, unicellular, twisted, fine trichomes about 5 μm wide; fewer large, multicellular, uniseriate trichomes of about 6 cells; tapering, about 500 μm long by 90 μm wide at the base, frequently collapsed and contorted. Few glandular trichomes with short two-celled stalk and small multicellular head. Leaf epidermis with sinuous anticlinal walls, and slightly striated cuticle. Stomata anomocytic. Calcium oxalate in isolated prisms in the mesophyll, many small crystals less than 5 μm and a few about 50 μm long.

Total Ash: Not more than 16%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Lappa Herb contains antibacterial substances. (Cavallito, Bailey & Kirchner (1945) J. Am. Chem. Soc. 67 948).

Actions and Indications: Similar to Lappa Root.

Specific Indications: Used as a poultice for boils and abscesses.

LAPPA ROOT

SYNONYMS

Burdock Root; Bardane Root.

DEFINITION

Lappa Root consists of the dried underground parts of *Arctium lappa* L. (Fam. Compositae) gathered during the first year of growth. The plants are native British herbs, biennial, with long petioled, somewhat woolly, cordate ovate leaves up to 40 cm long, forming a rosette in the first year.

Lappa Root contains a bitter principle and much inulin.

Martindale, 25th Edn., p. 1531. B.P.C. (1934), p. 586.

DESCRIPTION OF CUT ROOT

Macroscopical: Split, cylindrical pieces of root, the outer surface covered with brown cork and very longitudinally wrinkled, the inner surface mealy, buff-white. Taste mucilaginous and slightly bitter.

Microscopical: Xylem of lignified vessels up to 100 μm in diameter, reticulately thickened or with bordered pits. Sclerenchyma of a few, thin-walled lignified fibres. Mainly parenchyma, with many angular, pseudo-crystalline slightly birefringent masses of inulin giving no response to iodine water, and with a few grains of starch.

U.S.D., 22nd Edn., p 593.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Diuretic. Orexigenic.

Indications: Cutaneous eruptions. Rheumatism. Cystitis. Gout. Anorexia nervosa.

Specific Indications: Eczema, especially in dry and desquamatory phase. Psoriasis.

Combinations used: Combines well with *Rumex Crispus* or *Trifolium Pratense* in skin disease.

Preparations and Dosage: (thrice daily)

Dried root 2-6 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-8 ml. Tincture 1:10 in 45% alcohol. Dose 8-12 ml. Decoction 1:20. Dose 500 ml/day.

LAVANDULA

SYNONYMS

Lavender; Lavender Flowers; *Lavendula spica* L.

DEFINITION

Lavandula consists of the flowers of *Lavandula officinalis* Chaix. (Fam. Labiatae), an evergreen shrub 1 metre in height, indigenous to Southern Europe but extensively cultivated in Southern France. The herb flowers between July and September, and the flowers occur in whorls of 6-10 as terminal spikes of verticillasters. The fresh flowers contain 0.5% of volatile oil consisting chiefly of linalyl acetate, linalool, geraniol, cineole, limonene and sesquiterpenes.

Martindale 27th Edn., p. 1019.

DESCRIPTION

Macroscopical: Inflorescence is a terminal spike, flowers arranged in verticillasters arising from the axil of a rhomboidal bract. Individual flowers up to 5mm in length, 1-2 mm wide, bluish-violet to pale-brown in colour, calyx tubular and ribbed fine-toothed and pubescent, shining oil glands visible amongst the hairs; corolla purple-grey, tubular and two-lipped, posterior lip having two lobes and the anterior one three lobes. Four stamens exserted from the hairy throat of the corolla. Occasional leaf fragments up to 2 cm in length and 2-3 mm wide, dark-green to pale-green in colour, oblanceolate-linear, prominent midrib on the under surface.

Microscopical: Grey-blue powder, fragments of calyx, elongated epidermal cells with wavy anticlinal walls, covering trichomes multicellular, branched and frequent, occurring in a dense mat. Encapsulated labiate oil glands; corolla fragments, almost oval slightly wavy-walled epidermal cells, labiate glands and branched covering trichomes; glandular trichomes, unicellular stalk, papillose towards the apex, terminating in a single-celled glandular head; pollen grains spherical to ellipsoidal, 24-30 μ m in diameter, 6 furrows and 6 pores, lines of pits radiating from the poles. Leaf fragments, almost straight-walled epidermal cells, covering branched trichomes and labiate oil glands, glandular trichomes, unicellular stalk and a bicellular head; bundles of narrow fibres and vessels from the midrib.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Thin-Layer Chromatography: Hörhammer, L. and Richter, G. (1963) Dtsch. Apoth-Ztg, 103, 1737.

THERAPEUTICS

Action: Carminative. Spasmolytic. Antidepressant. Antirheumatic. Oil – rubefacient.

Indications: Flatulent dyspepsia. Colic. Depressive headache. Oil – (topically) rheumatic pain.

Specific Indication: Depressive states associated with digestive dysfunction.

Combinations used: May be combined with Rosmarinus, Avena and Cola in depression; with Cypripedium and Valeriana in migrainous headache; with Filipendula and Cimicifuga in rheumatism. The oil may be used in combination with Oil of Gaultheria as a liniment in myalgia or intercostal neuralgia.

Preparations and Dosage: (thrice daily)

Dried flowers. Dose 1-2 g or by infusion. Tincture 1:5 in 60% alcohol. Dose 2-4 ml. Compound Lavender Tincture B.P.C. (1949). Dose 2-4 ml. Lavender Oil B.P.C. (1973). Dose 0.06-0.2 ml.

LEONURUS

SYNONYM

Common Motherwort.

DEFINITION

Leonurus consists of the dried aerial parts of *Leonurus cardiaca* L. (Fam. Labiatae) gathered during the flowering period. The plant is a herb native to Europe, introduced to Britain, upright, up to 120 cm tall, very hairy, with deeply palmately lobed leaves having serrated margins and long petioles, bearing axillary whorls of pale pink flowers.

Leonurus contains alkaloids, bitters and a volatile oil.

Martindale, 25th Edn., p. 1531.

DESCRIPTION OF CUT HERB

Macroscopical: Pieces of matted leaves of different shades of green. Groups of calyces, funnel-shaped, green-brown, with 5 stiff teeth, about 5 mm long, some containing downy petals. Many stem pieces, hollow, some collapsed, some split open, four-sided, hairy, pale green to brown. Nutlets tetrahedral. Taste bitter.

Microscopical: Covering trichomes many, some very long, uniseriate, of 2 to 5 cells, warty, pointed, thick-walled. Glandular trichomes of labiate type, with unicellular stalks and round, multicellular heads. Leaf epidermis with sinuous anticlinal walls. Stomata diacytic. Calcium oxalate absent from the leaf, but present as a layer of large prisms in the calyx. Pollen grains spherical, with a smooth exine and 3 furrows, 25 μ m diameter.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

Paper Chromatography: Isaev & Bojadzieva (1960) Nauchni Trud. vissh med. Inst. Vulko chervenkov. 37 145.

THERAPEUTICS

Action: Sedative. Antispasmodic.

Indications: Cardiac debility; simple tachycardia. Effort syndrome. Amenorrhoea.

Specific Indications: Cardiac symptoms associated with neurosis.

Combinations used: With Ballota for false labour pains.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

LEVISTICUM

SYNONYMS

Lovage; *Ligusticum levisticum* L.

DEFINITION

Levisticum consists of the dried root and rhizome of *Levisticum officinale* Koch (Fam. Umbelliferae) a native of the Mediterranean region. It is cultivated in Britain and the United States and normally collected from two to three year old plants. The plant is a perennial herb and may grow to a height of 1 m or more with a fleshy rhizome bearing numerous roots; radical leaves divided into wedge shaped segments; stems erect, hollow, channelled; flowers yellow, borne in umbels in June and July. Levisticum contains a volatile oil. The principal constituents of which are angelic acid and α and β terpineol. Levisticum contains also coumarins and furocoumarins including psoralen, rutoside, sitosterols, resins, and a bitter principle.

DESCRIPTION

Macroscopical: Chopped root and rhizome. Pieces 0.2-2.5 cm in length, 0.2-1 cm in diameter. External surface grey-brown longitudinally furrowed. Transverse surface showing inner bark, yellow-white, separated from the wood by a darker line; wood yellow-brown radiate; oil glands visible in outer region. Fracture short and starchy. Odour strongly aromatic; taste sweet and then slightly bitter.

Microscopical: Powder light brown. Starch grains abundant, simple or compound, spherical to ovoid, 6-14 μm in diameter. Parenchyma thin walled, non lignified; schizogenous secretory ducts with red brown contents. Xylem parenchyma thicker walled, lignified. Fibres absent. Vessels lignified, reticulately thickened. Cork cells polygonal or elongated in surface view with brown contents. Calcium oxalate absent.

Total Ash: Not more than 8%.

Thin-Layer Chromatography: Hörhammer, L., Wagner, H., Kraemer-Heydweiller, D. (1966). Deut. Apotheker-Ztg. 106 (9) 267-72 .

THERAPEUTICS

Action: Carminative. Anti-dyspeptic. Aids digestion. Spasmolytic. Diaphoretic. Diuretic. Emmenagogue. Expectorant. Antimicrobial.

Indications: Flatulent colic. Dyspepsia. Oedema, renal. Dysmenorrhoea. Delayed menses. Lithuria. Cystitis. Tonsillitis (gargle). Aphthous ulcers (mouth wash).

Specific Indication: Flatulent dyspepsia and anorexia.

Combinations Used: May be combined with Chamaemelum, Alpinia and Angelica Root in flatulent dyspepsia and intestinal colic: with Agropyron, Apium and Parietaria in renal dropsy: with Chamaelirium and Pulsatilla in dysmenorrhoea.

Preparations and Dosage: (thrice daily) .

Dried root. Dose 0.5-2 g as decoction in water or milk. Liquid Extract 1:1 in 45% alcohol. Dose 0.5-2 ml.

LINUM

SYNONYMS

Flaxseed; Linseed.

DEFINITION

Linum consists of the dried ripe seeds of *Linum usitatissimum* L. (Fam. Linaceae), an erect annual herb growing about 2 ft in height. It is cultivated in most temperate and tropical regions. The plant produces blue flowers and a globular capsule containing about ten seeds. Linum contains 30-40% of fixed oil consisting chiefly of glycerides of linoleic and linolenic acids together with oleic, stearic and palmitic acids; 6% of mucilage, 25% of protein together with wax, resin, sugar and a glycoside, linamarin.
B.P.C. (1954), p. 418. Martindale 27th Edn., p. 926.

DESCRIPTION

Macroscopical: Seeds, flattened ovate and pointed at one end, 4.6 mm long and 2.5 mm wide, outer surface brown, glossy and minutely-pitted. Transverse section exhibits a narrow endosperm and two plano-convex cotyledons. Odourless; taste mucilaginous and oily.

Microscopical: Cream-brown oily powder; isodiametric epidermal cells with mucilaginous walls, collenchymatous cells of the middle layer of the testa, spherical; lignified and pitted sclerenchymatous cells 120-200 μ m long and 14-18 μ m wide, associated with elongated, thin-walled hyaline cells running at right angles; polygonal pigment cells with red-brown contents, aleurone grains from the cotyledons 3-18 μ m in diameter; abundant fixed oil associated with irregular polygonal cells with moderately thick walls from the endosperm and the cotyledons.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 1%.

THERAPEUTICS

Action: Demulcent. Laxative. Antitussive. Emollient. Anodyne. Resolvent.

Indications: Respiratory catarrh. Bronchitis. Furunculosis. Pleuritic pains.

Specific Indications: Boils and carbuncles – poultice: bronchitis and thoracic pain – poultice.

Combinations used: May be combined with *Sinapis alba* as poultice in lower respiratory disease: with *Lobelia*, *Ulmus* and *Althaea* Root as poultice in furunculosis and localised swellings or inflammation.

Preparations and Dosage: (thrice daily)

Crushed or entire seeds. Dose 3-6 g or by infusion. Oil. Dose 5-30 ml, in vehicle, as purgative.

LIRIOSMA

SYNONYM

Muira-puama.

DEFINITION

Liriosma consists of the dried root of *Liriosma ovata* Miers (Fam. Oleaceae), a plant indigenous to Brazil.

Liriosma contains esters of behenic and arachidic acids and lupeol, together with free lupeol, campesterol and β sitosterol.

DESCRIPTION

Macroscopical: Pieces and splinters of root, varying in size up to about 2 cm in length, 0.5 cm in width, composed mainly of wood but small fragments of bark also present; wood pieces hard, tough and coarsely fibrous, pale brown in colour; bark pieces darker with outer greyish brown cork, longitudinally furrowed, and inner surface with fine, longitudinal striations. Odour faintly aromatic; taste aromatic and slightly astringent.

Microscopical: Powder light brown. Fibres very abundant, thick walled and lignified, often occurring in groups associated with fragments of uniseriate medullary rays; cells of the medullary rays and xylem parenchyma thinner walled and lignified, with numerous pits; vessels lignified and bordered pitted, the pits small and numerous with distinct, circular borders. Occasional thick-walled sclereids and lignified fibres from the bark, occurring singly and in small groups accompanied by a crystal sheath containing prisms of calcium oxalate 10-15 μm wide, 10-20 μm long; also from the bark, fragments of unlignified parenchyma with dark brown contents and thin-walled cork. Starch infrequent, mostly simple, ovoid granules up to 10 μm with a cleft hilum.

THERAPEUTICS

Action: Astringent. Aromatic. Formerly used in Brazil as aphrodisiac.

Indications: Dysentery. Impotence.

Preparations and Dosage: (thrice daily)

Dried root by decoction. Dose 0.5-2 g. Liquid Extract 1:1 in 60% alcohol.

Dose 0.5-2 ml.

LOBARIA

SYNONYMS

Lungwort; Oak Lungs; Lung Moss; Tree Lungwort; *Sticta pulmonacea* Ach., *Sticta pulmonaria* Hook.

DEFINITION

Lobaria consists of the dried thallus of the lichen *Lobaria pulmonaria* (L.) Hoffm. (Fam. Stictaceae) found throughout Europe growing on old trees and mossy rocks. *Lobaria* contains arabitol, gyrophoric acid, stictinic acid, thelephoric acid, proteins, ergosterol and fucosterol, aliphatic hydro-carbons and fatty acids including palmitic, oleic and linoleic acid.

DESCRIPTION

Macroscopical: Thallus foliose, wide-spreading, dichotomously divided lobes with truncate ends, margin sinuate, dark olive-green above when wet, pale green-brown when dry, upper surface deeply lacunose-ridged, ridges becoming eroded, often smooth and shiny or isidiate and sorediate above; underside tomentose, light brown to white convex areas corresponding to upper lacunae, depressions between lacunae darker brown. Taste slightly mucilaginous and bitter.

Microscopical: Thallus heteromerous; upper plectenchymatous cortex usually twice as thick as lower plectenchymatous cortex; gonidial layer beneath upper cortex of several cells thickness composed of green algal cells up to 10 μm diameter; central medulla of loosely packed fungal hyphae about ten times thickness of lower cortex; lower cortex about 20 μm thick, with tomentum of fungal hyphae which occur singly, 3 μm in diameter and up to 200 μm in length, or in groups; apothecia or discocarps variable in size with no gonidial tissue within disc, gonidia abundant at rim of disc; soredia light brown, abundant surrounding apothecia; isidia abundant at margin or mixed with soredia, frequently coralloid, light brown to red-brown, up to 200 μm diameter; ascospores colourless to brown, fusiform, up to 4-septate, 10 μm wide and 30 μm long, eight ascospores in each ascus.

Gas-Liquid Chromatography: Catalano, S., Marsili, A., Morelli, I. and Pacchiani, M. (1976) *Phytochemistry* 15, 221.

THERAPEUTICS

Action: Demulcent. Expectorant. Mucolytic. Orexigenic.

Indications: Bronchitis. Asthma.

Specific Indications: Cough in children.

Combinations used: May be prescribed with Marrubium, Tussilago and Lobelia in bronchitis.

Preparations and Dosage: (thrice daily)

Dried lichen. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

LOBELIA

SYNONYMS

Lobelia Herb; Indian Tobacco.

DEFINITION

Lobelia consists of the dried aerial parts of *Lobelia inflata* L. (Fam. Lobeliaceae), an erect annual herb indigenous to Eastern United States of America. It is collected when the lower fruits are nearly ripe and dried. Lobelia contains 0.3-0.4% of alkaloids consisting of lobeline, lobelanine, lobelanidine and several others; the herb also contains a neutral substance inflatin and lobelic acid.

B.P.C. (1973), p. 270. Martindale, 26th Edn., p. 1166.

DESCRIPTION

Macroscopical: Consisting of stems, fruits and leaves; stems green-brown in colour often with a purple tint, round, pubescent and sometimes winged with alternate leaves and leaf scars; leaves pale green to yellow-brown, broadly ovate to lanceolate ovate, from 4-8 cm long, margin toothed and lamina pubescent. Inflorescence of racemes from 6-20 flowers arising from the axils of upper leaves; bracts leafy, pedicels slender, about 2-4 mm long; flowers hermaphrodite and zygomorphic, 7 mm long, calyx superior, five sepals, corolla epigynous, tubular, about 4 mm long, bilabiate, androecium of five epigynous stamens with syngenesious anthers, gynoecium of 2 carpels, ovary inferior, bilocular, ovules numerous, stigma bifid and surrounded by tube of the anthers. Fruit an inflated, ovoid or ellipsoidal, bilocular capsule containing numerous brown ovoid reticulate seeds 0.4-0.6 mm long and 0.2-0.3 mm wide. Odour slight somewhat irritating; taste acid.

Microscopical: Dull yellow-green powder: fragments of leaf lamina, slightly wavy-walled upper epidermal cells exhibiting papillae; lower epidermis, wavy-walled anticlinal cells with frequent anomocytic stomata; unicellular, sometimes two-celled, covering trichomes with warty cuticle 200-500 μ m in length, occasionally longer; lignified pitted, xylem and pith parenchyma and thin-walled pitted fibrous cells from the stem: pollen grains 20-30 μ m in diameter, spherical, smooth exine and three pores; lignified sheets of thick wavy-walled sclereids from pericarp; large characteristic brown fragments of seed testa consisting of elongated thick-walled lignified polygonal cells. Jackson & Snowdon, p. 68.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 5%.

Foreign Organic Matter: Not more than 2%.

Content of Stalks: Not more than 60%.

Water Soluble Extractive: Not less than 20%.

Thin Layer Chromatography: Borio, B.L. and Moreira, A. (1964), *Trib Farmaceutica*. NR. 2-4, 64.

THERAPEUTICS

Action: Respiratory stimulant. Antasthmatic. Spasmolytic. Expectorant. Emetic.

Indications: Bronchitic asthma. Chronic bronchitis. Topically – Myositis. Rheumatic nodules.

Specific Indication: Spasmodic asthma with secondary bronchitis.

Combinations used: Combines well with Capsicum, Grindelia, Drosera, Symplocarpus, Euphorbia and Ephedra in asthma.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 0.2-0.6 g or by infusion or decoction. Liquid Extract 1:1 in 50% alcohol. Dose 0.2-0.6 ml. Tincture Lobelia (B.P.C. 1949), 1:8 in 60% alcohol. Dose 0.6-2 ml. Tincture Lobelia Acid 1:10 in dil. acetic acid. Dose 1-4 ml.

LYCOPUS

SYNONYMS

Bugleweed; Gypsywort; Water Horehound.

DEFINITION

Lycopus consists of the dried aerial parts of *Lycopus europaeus* (Fam. Labiatae). The plant is a North American herb up to 100 cm high, erect, somewhat hairy, usually with ascending branches, deeply toothed lanceolate leaves and purple-dotted white flowers, of the labiate type, in close whorls in the axils of the upper leaves.

Lycopus contains flavone glycosides (e.g. luteolin glucoside), volatile oil and tannins.

DESCRIPTION OF THE CUT HERB

Macroscopical: Leaf pieces curled or matted, some pieces light green but mainly dark green to brown. Brown shrivelled remains of flowers attached to stem pieces. Brown tetrahedral nutlets found in flower remains or isolated 0.5-1 mm long. Stem pieces, ribbed with 4 sides, hollow, often split showing white pith. Taste astringent, slightly bitter.

Microscopical: Covering trichomes of leaf 3 to 4 cells, uniseriate, with fairly thick, finely warted walls and pointed terminal cell. Occasional unicellular conical finely warted thin-walled trichomes. Glandular trichomes of the labiate type, with unicellular stalks and round heads of up to 4 cells. Epidermal cells with sinuous anticlinal walls and diacytic stomata. Very small prisms of calcium oxalate in the leaves and small clusters in the floral parts. Pollen grains spherical, with a finely granular exine and 3 furrows, about 30 μ m in diameter.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 3%.

Chromatography: Hörhammer, L., Wagner, H. & Schilcher, H. (1962). *Arzneimittel-Forsch.*, 12, 1.

THERAPEUTICS

Action: Cardioactive diuretic, increasing force of myocardial contraction and reducing heart-rate. Peripheral vasoconstrictor. Anti-haemorrhagic. Antitussive. Sedative. Thyroxine antagonist.

Indications: Nervous tachycardia. Grave's disease with cardiac involvement. Irritating cough with copious sputum. Haemoptysis.

Specific Indications: Thyrotoxicosis with dyspnoea, tachycardia and tremor.

Combinations used: Combines well with *Scoparium* and/or *Convallaria* in cardiac cases. May be used with *Prunus*, *Bidens*, and/or *Asclepias* for pulmonary conditions.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-3 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-3 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

MARRUBIUM

SYNONYM

Hoarhound; White Horehound; Horehound.

DEFINITION

Marrubium consists of the dried leaves and flowering tops of *Marrubium vulgare* L. (Fam. Labiatae). The plant is an erect herb, indigenous to Britain and widely distributed over Europe. Marrubium contains a little volatile oil, diterpenes marubiin, premarrubiin, marrubiol, vitamin C, resins, wax, sterols. Some samples are stated to contain an alkaloid.

Martindale, 26th Edn., p. 711. B.P.C. (1949), p. 511. Merck Index, 8th Edn., p. 536.

DESCRIPTION

Macroscopical: Brown quadrangular stem, containing a spongy white pith. Pieces of green-brown leaf finely chopped and curled, 1-3 mm wide and 2-5 mm long, crenate margin, reticulate on both sides and covered on the under surface with soft, woolly, white trichomes. Flowers small, white, arranged in dense axillary clusters 0.5 to 1.0 cm in diameter. Calyx covered with white hairs, having ten recurved hooked teeth, some of which may be broken. The corolla, if present, is white and bilabiate. Few seeds present, brown, oval, 1 mm in length and 0.5 mm in diameter. Odour faint, pleasant; taste bitter.

Microscopical: Powder grey-green in colour. Epidermal cells of leaf and corolla rectangular or slightly wavy-walled, elongated over the veins, thick irregular cuticle and numerous stomata on the upper surface, clusters of calcium oxalate in the mesophyll of the leaf. Candelabra trichomes, 2-5 branches of one or two cells jointed at the base, broken pieces of faintly lignified trichomes frequent in the powder. Long multicellular uniseriate trichomes of leaf and calyx; few glandular trichomes with unicellular stalk and unicellular or bicellular head; larger sessile glands with a multicellular head. Infrequent pollen grains 30 μ m in diameter with 3 pores, 3 furrows and a pitted exine. Sheets of lignified, thick, wavy-walled stone cells from seed coat. Long, unicellular, curled covering hairs of the young stems; pitted parenchyma of the stem, some containing starch; lignified fibres, pitted vessels and rectangular cork cells of the older stems.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Water Soluble Extractive: Not less than 10%.

Thin Layer Chromatography: Popa, D.P., Pasechnik, G.S. and Phan, T.A. (1968), *Khim. Priv. Soedin*, 4, 345-8.

THERAPEUTICS

Action: Expectorant. Spasmolytic.

Indications: Acute or chronic bronchitis. Whooping cough.

Specific Indication: Bronchitis with non-productive cough.

Combinations used: Combines well with Cephaëlis, Tussilago and Lobelia. May be used with Zingiber in whooping cough.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 20% alcohol. Dose 2-4 ml.

MARSDENIA

SYNONYMS

Condurango; Gonolobus condurango (Triana) Nichols.

DEFINITION

Marsdenia is the dried bark of *Marsdenia cundurango* Rchb. f. (Fam. Asclepiadaceae), a climbing plant indigenous to Ecuador and Peru. The bark is removed by beating the stems with a mallet and is then sun dried. Marsdenia contains a mixture of glycosides known as condurangin, resin, tannin, fixed oil and fermentable sugars.

B.P.C. (1934), p. 352. Martindale 27th Edn., p. 254.

DESCRIPTION

Macroscopical: Curved or quilled pieces of bark, 5-10 cm long and up to 2.0 cm wide. Externally light grey to brown, cortex often warty and sometimes scaly with brownish-black apothecia of lichen; inner surface grey to white or sometimes light-brown, longitudinally striated. Fracture short and somewhat fibrous. Odour slightly aromatic; taste bitter and aromatic.

Microscopical: Light yellow-brown powder. Sclereids in large groups, individual cells irregular in shape with thick porous walls; calcium oxalate mainly in the form of clusters but occasionally single prisms 10-35 μm in length; starch granules 3-20 μm in diameter, mainly single grains but occasionally up to four compound. Thin-walled non-lignified fibres, very long and 10-30 μm in width. Fragments of thin-walled latex cells filled with granular dried latex; cork fragments, grey or yellow to brown.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 2%.

Content of Stalks: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

THERAPEUTICS

Action: Bitter. Orexigenic. Gastric sedative.

Indications: Anorexia. Nervous dyspepsia.

Specific Indications: Anorexia nervosa.

Combinations used: May be used with Gentiana, Chelone, Chamaemelum, Humulus and Acorus in anorexia nervosa.

Preparations and Dosage: (thrice daily)

Powdered bark. Dose 1-4 g or by infusion. Liquid Extract B.P.C. (1923). Dose 0.6-3.6 ml.

MATRICARIA

SYNONYM

German Chamomile. *Matricaria chamomilla* L.

DEFINITION

Matricaria is the dried flower-heads of *Matricaria recutita* L. (Fam. Compositae), an annual herb indigenous to Europe and Western Asia, and now naturalised in Australia and the United States. The flower-heads are collected when they are mature or expanded. *Matricaria* contains 0.25% of volatile oil which has an intense blue colour due to azulene; also a bitter principle, anthemiac acid; a flavone glycoside, anthemidin, malic acid and tannin.

B.P.C. (1949), p. 513. Martindale 27th Edn., p. 1020.

Macroscopical: Conical flower heads 3-10 mm in breadth; a narrow hollow receptacle and a short peduncle; involucre of 20-30 oblanceolate pubescent scales, brown with white margins. 10-20 pili-stillate ray florets about 12 mm in length with a white 3-toothed, 4-veined corolla; numerous disc florets 2-5 mm in length; achenes obovoid about 0.5 mm in length, faintly 3-5 ribbed. Tubular florets, ovary with glandular hairs, nectaries, corolla tube with narrow lobes, stamens and anthers; ligulate florets, ovary with bifid stigma.

Microscopical: Brown to yellow powder; pollen grains numerous 18-25 μ m in diameter, spheroidal or triangular with three pores and a spiny exine; fragments of corolla with sessile 8-celled glandular trichomes; characteristic cells of the anthers; stigma with papillae; cells of the achenes with scalariform perforations in walls; sclerenchymatous fibres of involucre scales; occasional fibres from the stems.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 8%.

Water Soluble Extractive: Not less than 15%.

Content of Stalks: Not more than 10%.

Thin Layer Chromatography: Sarkany-Kiss, J., Mathe, I. (1963), Pharm. Zentralthalle, 102, 128.

THERAPEUTICS

Action: Carminative. Spasmolytic, Mild sedative. Anti-inflammatory. Antiseptic. Anticatatarrhal.

Indications: Flatulent, nervous dyspepsia. Travel sickness. Nasal catarrh. Nervous diarrhoea. Restlessness.

Topically: Haemorrhoids: Mastitis: Leg ulcers.

Specific Indication: Gastro-intestinal disturbance with associated nervous irritability in children.

Combination used: May be combined with *Althaea*, *Filipendula*, *Ballota* and *Humulus* in nervous dyspepsia. Combines with *Valeriana*, *Passiflora* and *Humulus* in restlessness.

Preparations and Dosage: (thrice daily)

Dried flower-heads. Dose 2-8 g or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 1-4 ml.

Note: Store in a cool place, in airtight containers, protected from light.

MEDICAGO

SYNONYMS

Lucerne; Alfalfa; Purple Medick.

DEFINITION

Medicago is the dried whole herb of *Medicago sativa* L. (Fam. Papilionaceae), a perennial found all over Europe and cultivated in Britain mainly as cattle feed. The plant reaches a height of about 60 cm, it has trifoliate leaves, the leaflets being about 2 cm long by 0.5 cm broad; the flowers are blue, borne in a dense raceme; the fruit a spiral legume. Medicago contains protein, fat, pro-vitamin A, vitamin E and small amounts of vitamins B₁, B₂, C, D and K, isoflavonoid phytoalexins including pterocarpan, isoflavone phytoestrogens formononetin and coumestrol, and alkaloids asparagine and trigonelline.

DESCRIPTION

Macroscopical: Fragments of leaf abundant, leaflets often whole, folded, margin serrate in the upper part, apex acute, upper surface glabrous, lower surface with scattered long, whitish hairs. Stem pieces hollow, ridged, up to 5 mm diameter. Flower fragments pink when dried. Odour and taste slight.

Microscopical: Powder green. Epidermis of leaf, wavy-walled cells with anisocytic or anomocytic stomata on both surfaces; covering trichomes on undersurface consisting of two short basal cells and a tapering terminal cell up to 1 mm long with a thick wall and warty cuticle; glandular trichomes from undersurface and calyx with uniseriate stalk usually of 4 cells and a multicellular head of 2-4 cells. Groups of fibres with calcium oxalate prism crystal sheath. Epidermis of corolla papillose with striated cuticle; pollen grains spherical, 30-35 μ m in diameter, with 3 pores and 3 germinal furrows, exine smooth. Oil globules visible, also aleurone grains containing crystalloids.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

THERAPEUTICS

Action: Nutrient. Source of vitamins A, C, E and K. Source of mineral salts – calcium, potassium, phosphorus and iron.

Indications: Avitaminosis A, C, E or K. Hypoprothrombinaemic purpura. Debility of convalescence.

Specific Indication: Avitaminosis.

Combinations Used: Combines with Chondrus and Ulmus in convalescent debility; with Ruta and Fagopyrum in purpura.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 5-10 g or as infusion. Liquid Extract 1:1 in 25% alcohol. Dose 5-10 ml.

MELISSA

SYNONYMS

Balm; Lemon Balm.

DEFINITION

Melissa consists of the dried aerial parts of *Melissa officinalis* L. (Fam. Labiatae). The plant is a herb native to Southern Europe, Asia Minor and North Africa, introduced to Britain, upright, up to 60 cm tall, lemon scented, with rough cordate, serrated leaves, bearing axillary whorls of white or pale pink flowers.

Melissa yields a volatile oil containing terpene aldehydes.

Martindale, 25th Edn., p. 858.

DESCRIPTION OF CUT HERB

Macroscopical: Pieces of thin, folded, rough, dark green leaves with serrate margins. Some pale green, conical calyces, somewhat longer than 5 mm with 2 teeth on one side. Many stem pieces, four-sided, light brown. Odour faint, of lemon.

Microscopical: Many covering trichomes, warty, either unicellular and conical, or uniseriate, of up to 6 cells, thin walled, long, wide at the base, narrowing suddenly. Glandular trichomes of labiate type, with unicellular stalks and either large, round heads of 8 cells or small uni- or bi-cellular heads. Leaf epidermal cells with sinuous anticlinal walls and a striated cuticle. Stomata diacytic, in the lower epidermis only. Calcium oxalate absent. Pollen grains spherical with a finely granular exine and 6 furrows, about 40 μm in diameter.

Deryng, p. 148-9. Flück *et al.* p. 154-6.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Carminative. Antispasmodic. Diaphoretic. Sedative.

Indications: Flatulent dyspepsia. Neurasthenia. Depressive illness.

Specific Indications: Dyspepsia associated with anxiety or depressive states.

Combinations used: In gastric dyspepsia may be combined with Chamaemelum, Humulus and Filipendula.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 45% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

MENTHA PIPERITA

SYNONYM

Peppermint.

DEFINITION

Mentha Piperita consists of the aerial parts of *Mentha piperita* L. (Fam. Labiatae) a perennial herb attaining a height of about 60 cm. There are two varieties known as white peppermint (forma *pallens*) and black peppermint (forma *rubescens*). The plant grows wild in Britain and Europe and is extensively cultivated in Central and Southern Europe and America. It is collected just before the flowers open and carefully dried. *Mentha Piperita* contains 0.5-1.5% volatile oil, which consists of not less than 45% free menthol together with menthone, menthofuran, menthyl acetate and terpenes.

B.P.C. (1954), p. 553. Martindale 27th Edn., p. 1024.

DESCRIPTION

Macroscopical: Cut herb, stem fragments quadrangular, purple to green in colour with scattered deflexed trichomes and petiolate, ovate-lanceolate leaves, 3-8 cm long and 4 cm wide when whole, often chopped into fragments 0.5-1 cm long, acute and sharply serrate; small purple flowers occurring in terminal, obtuse spikes consisting of closely arranged verticillasters, each flower having a five-toothed tubular calyx, a four-lobed campanulate corolla and four equal epipetalous stamens. Odour strong and characteristic; taste pungent and cooling.

Microscopical: Dark green powder; leaf fragments with partially sunken labiate glands on both surfaces; long, pointed, uniseriate trichomes of 6-8 cells with striated cuticle; occasional trichomes of 2 or 3 cells the terminal cell often being globular; epidermal cells of both surfaces with sinuous anticlinal walls; caryophyllaceous diacytic stomata mostly confined to the lower side; single layer of palisade cells; vascular strands from the petiole; calcium oxalate absent.

Total Ash: Not more than 12.5%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Thin-Layer Chromatography: Wellendorf, M. (1963) Dansk. Tielskr. Farm., 37, 145.

THERAPEUTICS

Action: Spasmolytic. Carminative. Diaphoretic. Antemetetic.

Locally: Antiseptic. Antipruritic.

Indication: Intestinal colic. Vomiting of pregnancy. Flatulent dyspepsia. Common cold. Dysmenorrhoea.

Specific Indication: Flatulent digestive pains.

Combinations used: May be combined with *Sambucus* and *Achillea* or *Eupatorium Perfoliatum* in influenzal colds; combines well with *Pimpinella*.

Preparation and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Concentrated Peppermint Water B.P. (1973). Dose 0.25-1.0 ml. Oil. Dose 0.05-0.2 ml.

MENTHA PULEGIUM

SYNONYMS

Pennyroyal; Pulegium; European Pennyroyal.

DEFINITION

Mentha Pulegium consists of the dried aerial parts of *Mentha pulegium* L. (Fam. Labiatae), a herb indigenous to Britain and Europe. The plant may be prostrate or erect, the stems quadrangular and much branched, often purplish. Leaves shortly stalked, oval or elliptical, 6-20 mm long, 0.5-10 mm in width, margin entire or crenate, both surfaces distinctly pubescent, bracts similar but may be smaller; flowers numerous, pale purple-mauve, in whorled clusters commencing half way up the stem. *Mentha Pulegium* contains a volatile oil, the main component of which is a ketone, pulegone. B.P.C. (1934), p.638.

DESCRIPTION

Macroscopical: Pieces of leaf, broken or folded, smaller leaves and bracts whole, both surfaces pubescent and markedly punctate; fragments of stems, sometimes with purplish tint, younger stems and pedicels, which may be attached, distinctly pubescent. Flowers individual or in clusters, calyx pale purple, 2-6 mm long, puberulent or hispid, tubular and funnel-shaped with lanceolate-acuminate teeth half as long as the tube, the two lower teeth longer and narrower than the others; corolla tube longer, 4 lobed, blue-purple, hairy on the outside, gibbous on the lower side. Nutlets ovoid, about 1 mm long. Odour and taste, mint-like and characteristic.

Microscopical: Powder brownish green. Epidermal cells of the leaves slightly wavy-walled on both surfaces, with diacytic stomata; glandular trichomes abundant, labiate type with unicellular stalk and 8-10 celled head, some smaller with a single celled head. Covering trichomes numerous, scattered and attached to fragments of epidermises of the leaves, calyx and corolla; some unicellular, wide at the base and abruptly tapering, with a warty cuticle, others uniseriate, 3-5 cells long, cuticle smooth or warty, the end cell tapering to a blunt point. Epidermis of calyx and corolla composed of elongated, wavy-walled cells with abundant glandular trichomes similar to those on the leaf, and numerous covering trichomes, particularly on the margins. Pollen grains sub-spherical, 25-30 μ m in diameter, with 6 pores and furrows and a finely warted exine.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

THERAPEUTICS

Action: Carminative. Spasmolytic. Diaphoretic. Emmenagogue.

Topically: Refrigerant. Antiseptic. Insect repellent.

Indications: Flatulent dyspepsia. Intestinal colic. The common cold. Delayed menstruation.

Topically: Cutaneous eruptions. Formication. Gout.

Specific Indications: Delayed menstruation owing to chill or nervous shock.

Contra-Indication: Inadvisable in pregnancy.

Combinations Used: May be combined with Chamaelirium, Millefolium and Picrasma in acute amenorrhoea; with Filipendula, Althaea Root and Melissa in flatulent dyspepsia; with Sambucus and Millefolium in the common cold.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-4 g or as infusion. Liquid Extract 1:1 in 45% alcohol. Dose 1-4 ml.

MENYANTHES

SYNONYMS

Bogbean; Buckbean; Marsh Trefoil.

DEFINITION

Menyanthes consists of the dried leaves of *Menyanthes trifoliata* L. (Fam. Menyanthaceae) gathered after flowering. The plant is a native British aquatic herb, with leaves raised above the water surface, consisting of 3 obovate leaflets with slightly sinuous margins, on a long petiole. Menyanthes contains glycosides, including bitters.

Martindale, 25th Edn., p. 618.

DESCRIPTION OF DRIED LEAVES

Macroscopical: Flat pieces of the thin, brittle, bright green leaves. Petiole fragments, several cm long, perhaps dividing into three at one end, buff-green. Taste bitter.

Microscopical: Epidermal cells with fairly straight anticlinal walls on the upper surface and more sinuous walls on the lower surface. Stomata large, anomocytic, in both epidermises, with faint cuticular striations radiating from each side. Calcium oxalate and trichomes absent.

Deryng., p. 152-3. Flück *et al.* p. 160-1.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 25%.

Paper Electrophoresis: Okazaki & Hamada (1951) J. Pharm. Soc. Japan 71 464.

THERAPEUTICS

Action: Bitter. Diuretic.

Indications: Rheumatism. Rheumatoid arthritis.

Specific Indications: Muscular rheumatism associated with general asthenia.

Combinations used: Combines well with Apium or Cimicifuga.

Contra-indications: In diarrhoea, dysentery or colitis.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml. Tincture 1:5 in 45% alcohol. Dose 1-3 ml.

MILLEFOLIUM

SYNONYMS

Milfoil; Yarrow.

DEFINITION

Millefolium consists of the dried aerial parts of *Achillea millefolium* L. (Fam. Compositae) gathered during the flowering period. The plant is a native British herb, usually up to 45 cm tall, upright, scented, with finely divided leaves, and bearing numerous dense heads of small compositous flowers with only 5 or 6 white or pink ray florets.

Millefolium yields a volatile oil containing azulene, and achilleine, a glyco-alkaloid.

Martindale, 25th Edn., p. 1499.

DESCRIPTION OF CUT HERB

Macroscopical: Green fragments of the pinnate leaves, the downy segments being linear and finely pointed. Many small flower heads surrounded by long felted hairs. Stem pieces ribbed, rounded, pithy, downy, green to red-violet. Odour fragrant.

Microscopical: Covering trichomes long (up to 1.5 mm), uniseriate, with 3 to 6 small cells at the base and a long pointed terminal cell. Glandular trichomes compositous with about 4 pairs of cells. Leaf epidermal cells elongated with sinuous anticlinal walls. Stomata anomocytic. Calcium oxalate absent from leaf. Pollen grains composituous, about 30 μ m in diameter, with a coarsely spiny exine, and 3 pores.

Deryng, p. 250-3. Flück *et al.* p. 267-9.

Total Ash: Not more than 10%.

Total Paper Chromatography: Oswiecimska & Miedzobrodzka (1966) Diss. Pharm. Pharmac. 18 601.

THERAPEUTICS

Action: Diaphoretic. Antipyretic. Hypotensive. Astringent. Diuretic and urinary antiseptic.

Indications: Fevers, common cold. Essential hypertension. Amenorrhoea. Dysentery and diarrhoea.

Specific Indications: Thrombotic conditions with hypertension, including cerebral and coronary thromboses.

Combinations used: Used with Sambucus and Mentha Piperita as febrifuge, with Tilia in essential hypertension.

May be combined with Urtica and *Melilotus officinalis* in coronary thrombosis.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

MITCHELLA

SYNONYM

Squaw Vine.

DEFINITION

Mitchella consists of the entire dried plant of *Mitchella repens* L. (Fam. Rubiaceae) a creeping herb indigenous to wooded areas of Eastern and Central United States. Mitchella contains tannin, a bitter principle and a saponin.

DESCRIPTION

Macroscopical: Loosely matted masses of branched rhizomes and fine roots together with aerial stems and leaves. Rhizomes light-yellow to brown, filiform, with slender fibrous roots; stems quadrangular or flattened, green, finely striated and bearing opposite leaves; leaves 2 cm long, dark-green, coriaceous, round to ovate, entire margin, short petiole, prominent veins on upper surface. Odour faint; taste slightly bitter.

Microscopical: Light grey-green powder; leaf fragments, wavy walled epidermal cells with a striated cuticle, paracytic stomata, collenchyma cells, occasionally containing a yellow amorphous mass, trichomes absent. Root and rhizome fragments, cortical parenchyma containing raphides of calcium oxalate 20-55 μm long, starch grains simple, ellipsoidal, up to μm in diameter; lignified reticulate or spiral vessels; fragments of cork rare.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Partus praeparator. Antidysmenorrhoeic. Astringent.

Indications: Dysmenorrhoea. Pregnancy. Catarrhal colitis.

Specific Indication: Facilitation of parturition.

Combinations used: Combines well with Rubus as a partus praeparator; and with Pulsatilla in dysmenorrhoea.

Preparation and Dosage: (thrice daily)

Dried plant. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

MYRICA

SYNONYMS

Wax Myrtle Bark; Bayberry Bark; Candleberry Bark.

DEFINITION

Myrica consists of the dried bark of the root of *Myrica cerifera* L. (Fam. Myricaceae) collected in Autumn. The plant varies from a low evergreen dioecious shrub to a tree occasionally 10 m high native to the east coast region of North America. It produces clusters of small wax-covered berries. Myrica contains myricinic acid (an acrid astringent resin) tannic and gallic acid, a red colouring matter and a small amount of volatile oil. Martindale, 25th Edn., p. 1415 (B.P.C. 1949), p. 542.

DESCRIPTION OF CUT BARK

Macroscopical: Flat pieces of bark, larger pieces 1.5×0.7 cm in area and 0.2 cm thick, together with many smaller pieces. White to silver-grey cork on the outer surface of the larger pieces, but absent in the majority exposing a reddish brown surface and occasional root scars. Inner surface dark-brown and fibrous. Fracture short, granular and slightly fibrous in the inner part. Odour sweet, aromatic, sternutatory. Taste bitter and astringent, becoming pungent and acid.

Microscopical: Powder light reddish-brown. Abundant simple or 2-3 compound starch grains up to $16 \mu\text{m}$ in diameter. Lignified phloem fibres in groups with narrow lumens and thick heavily pitted walls. Sclereids in groups, spherical to oval, with large lumens and heavily pitted walls. Calcium oxalate prisms, scattered, and in files of parenchyma cells surrounding the groups of fibres. Patches of thick walled parenchyma filled with a yellowish brown substance. Polygonal brown cork cells.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Astringent. Circulatory stimulant; mild diaphoretic.

Indications: Diarrhoea. Colds. Sore throat (infusion used as gargle). Leucorrhoea (infusion as douche). Indolent ulcers (topical application of the powdered bark).

Specific Indications: Mucous colitis.

Combinations used: Combines well with *Quercus* in diarrhoea. Often administered with Capsicum, Zingiber, *Eugenia caryophyllus*.

Preparations and Dosage: (thrice daily)

Powdered bark. Dose 0.6-2 g by infusion or decoction. Liquid Extract 1:1 in 45% alcohol. Dose 0.6-2 ml.

MYRISTICA

SYNONYM

Nutmeg.

DEFINITION

Myristica consists of the dried kernels of *Myristica fragrans* Houtt. (Fam. Myristicaceae), a tree cultivated in Indonesia and the West Indies and indigenous to the Moluccas. *Myristica* contains not less than 5% of volatile oil consisting of terpenoids including α and β -pinene, about 35% of fixed oil containing myristic acid (60%), palmitic, oleic, linoleic and lauric acids, and small amounts of myristicin, elemicin and safrol.

B.P.C. (1973), p.333, Martindale, 27th Edn., p.1022.

DESCRIPTION

Macroscopical: Ovoid kernels about 3 cm long and 2 cm broad at the widest point; pale brown surface exhibiting a network of reticulate grooves and marked with numerous dark brown points and lines. Eccentrically located circular elevation about 5 mm wide at the broader end and connected by a groove to the chalaza, a circular depression at the narrow end. Transverse section shows a pale brown endosperm covered by a dark brown perisperm which penetrates the endosperm in numerous infoldings; embryo small, embedded near micropylar end. Odour aromatic; taste aromatic and bitter.

Microscopical: Red-brown oily powder. Fragments of the outer perisperm of polyhedral to rounded cells with thickened walls; inner ruminating perisperm, smaller polyhedral cells filled with red-brown contents. Endosperm, thin-walled large oyal to polyhedral cells containing a single aleurone grain up to 20 μm long and starch granules 2 to 10 compound, occasionally simple, about 20 μm in width, often embedded in a dark brown fatty mass. The fat forms radiating groups of feathery crystals when the preparation is heated and cooled.

Total Ash: Not more than 3%.

Acid Insoluble Ash: Not more than 0.2%.

Chromatography: Klouwen, M.H., u.R. Ter Heide (1962). *Parfumerie u-Kosm*, 43, 195.

THERAPEUTICS

Action: Carminative. Spasmolytic. Antemetic. Orexigenic. Gastric secretory stimulant. Prostaglandin inhibitor.

Topically – Antirheumatic.

Indications: Flatulent dyspepsia. Nausea. Diarrhoea. Dysentery.

Topically – Rheumatism (liniment, cream).

Specific Indication: Flatulent nervous dyspepsia.

Combinations Used: May be combined with *Chamaemelum*, *Melissa*, *Althaea Root* and *Humulus* in nervous dyspepsia; with *Acorus*, *Geranium*, *Quercus* and *Black Catechu* in diarrhoea and dysentery.

Preparations and Dosage: (thrice daily)

Dried seed, powdered. Dose 0.3-1 g.

Caution: Large quantities are hallucinogenic and excitant to the motor cortex.

NEPETA CATARIA

SYNONYMS

Catmint; Catnip; Catnep.

DEFINITION

Nepeta Cataria consists of the leaves and flowering tops of *Nepeta cataria* L. (Fam. Labiatae) a perennial herb common in Europe and naturalised in the United States. *Nepeta Cataria* contains a volatile oil the principal constituents of which are citronellol, geraniol and citral, a bitter principle and tannins.

DESCRIPTION

Macroscopical: Leaves ovate cordate, petiolate, 3-7 cm long may be broken into smaller pieces, upper surface dark-green, lower surface white-green and tomentose, apex acute, margin coarsely serrate. Stems quadrangular and pubescent, bracts similar to the leaves but smaller. Flowers small in dense interrupted spikes, calyx pubescent, teeth lanceolate-subulate, tube ovoid, corolla white with purple spots, throat dilated, limb bilabiate. Odour aromatic and mint-like; taste bitter, pungent and aromatic.

Microscopical: Light to grey-green powder; leaf fragments, epidermis of very wavy-walled cells; stomata paracytic; single layer of palisade cells. Covering trichomes long, from 3-7 cells, uniseriate, warty-walled with pointed ends, basal cell up to 50 μ m in diameter. Glandular trichomes of two types; typical labiate trichomes, single-celled stem with multicellular encapsulated head; smaller glandular trichomes, single celled stem with a uni- or bi-cellular head. Vessels, annular and reticulate thickening, collenchyma and lignified fibres of the stem xylem. Calcium oxalate absent.

Total Ash: Not more than 13%.

Acid Insoluble Ash: Not more than 2%.

Stems: Not more than 5% over 4 mm diameter.

THERAPEUTICS

Action: Aromatic. Carminative. Spasmolytic. Diaphoretic. Febrifuge. Antidiarrhoeal. Sedative.

Indications: Nervous dyspepsia. Colic in children. Colds. Headache. Insomnia. Topically: as ointment in haemorrhoids.

Specific Indications: Flatulent colic in children. The common cold.

Combinations used: May be combined with *Mentha Piperita* in children's colic; with *Millefolium*, *Sambucus*, *Capsicum* and *Eupatorium Perfoliatum* in the common cold.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 25% alcohol. Dose 3-6 ml.

NEPETA HEDERACEA

SYNONYMS

Ground Ivy; *Glechoma hederacea*.

DEFINITION

Nepeta Hederacea is the dried aerial parts of *Nepeta hederacea* L. Trev. (Fam. Labiatae) a creeping perennial herb common in the British Isles (with the exception of Scotland), Western Europe, North Asia and Japan. Contains bitter glechomine, 6-7% tannins, 0.03-0.06% volatile oil and choline.

DESCRIPTION

Macroscopical: Pieces of stem 0.5-2 cm long, 1-2 mm wide, four sided with prominent ridges at each corner. Yellow-green or purple in colour. Small leaf fragments 2-5 cm in diameter, grey-green to dark green and occasionally brown. Infrequent green fruit capsules 2 mm long containing three or four smooth brown oval nutlets, each containing a single oval flat seed.

Microscopical: Powder grey-green in colour, consisting of pieces of leaf; wavy-walled epidermal cells, striated cuticle, infrequent diacytic stomata, long thin unicellular faintly lignified trichomes, small unicellular pointed trichomes, glandular trichomes with a unicellular stalk and bicellular head and some larger, labiate type glandular trichomes. Large rectangular cells from stem parenchyma, some with beaded walls, lignified vessels with pitted and reticulate thickening. Short fragments of faintly lignified stem fibres and fibrous cells. Occasional pieces of yellow-brown fruit wall.

THERAPEUTICS

Action: Mild expectorant. Anticatarrhal. Astringent. Vulnerary. Diuretic. Stomachic.

Indications: Chronic respiratory catarrh. Bronchitis. Tinnitus aurium. Diarrhoea. Haemorrhoids. Cystitis. Gastritis.

Specific Indication: Chronic bronchial catarrh.

Combinations used: May be combined with Tussilago, Marrubium, Inula and Glycyrrhiza for cough.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

NYMPHAEA

SYNONYMS

White Pond Lily (American); Water Nymph; Water Cabbage.

DEFINITION

Nymphaea consists of the cut, dried rhizome of *Nymphaea odorata* Soland. (Fam. Nymphaeaceae). The plant is a perennial water lily, a native of the United States.

DESCRIPTION

Macroscopical: Irregular transversely cut pieces of rhizome up to 5 cm in diameter. Outer surface dark greyish brown to black, bearing remains of the leaf bases and roots; the leaf bases up to about 1 cm in diameter, their cut surfaces elliptical or rounded and showing scattered circular depressions; leaf buds also present especially on the apical pieces of rhizome, with a dense covering of fine, grey, cottony hairs. Transverse surface of rhizome yellowish brown with an interrupted ring of varying thickness forming finely porous depressed areas immediately inside the cork; faint ridges of obliquely cut vascular bundles scattered irregularly over the remainder of the transverse surface.

Fracture short, starchy. Odour slight; taste mucilaginous and slightly pungent.

Microscopical: Powder yellowish to greyish brown. Starch grains mostly simple and rounded, 10 to 25 μm in diameter with a radiate hilum, some compound, usually with 2 but occasionally up to 7 components. Characteristic large, branched, sclerenchymatous idioblasts (asterosclereids) with numerous small cubic crystals of calcium oxalate embedded in the strongly thickened walls. Abundant thin-walled parenchymatous cells, some forming lacunose tissue and showing conspicuous pit areas on the walls, others rounded and occurring in groups with yellow contents. Numerous fragments of thin-walled, multicellular and uniseriate covering trichomes up to 45 μm wide, the basal cells slightly lignified. Tracheids occurring singly or in groups, up to 50 μm in diameter, lignified and with spiral or annular thickening. Cork cells infrequent, polygonal and thin walled.

THERAPEUTICS

Action: Astringent. Demulcent. Antimicrobial.

Indications: Chronic diarrhoea. Pharyngitis (as gargle).

Topically: Leucorrhoea (as douche): boils (as poultice).

Specific Indication: As a douche in leucorrhoea and vaginitis.

Combinations Used: May be combined with *Quercus* and *Myrica* in diarrhoea: with *Trillium* and *Geranium* as a douche in leucorrhoea: with *Linum* and *Ulmus* in equal parts as a poultice in boils and abscesses.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 1-2 g as infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

OPUNTIA

SYNONYM

Cactus Flowers.*

DEFINITION

Opuntia consist of the dried flowers of *Opuntia* species (Fam. Cactaceae).

The plants are native to Mexico.

Opuntia contain yellow flavonoid glycosides.

DESCRIPTION OF FLOWERS

Macroscopical: Flowers pale sulphur yellow, light weight, up to 3 cm long, with a diameter of 1.5 cm with a collapsed group of petals at one end, about a dozen, 2.5 cm long and 1.5 cm wide when relaxed, showing transition to shorter, thicker sepals on the outside, enclosing a lobed stigma surrounded by a mass of stamens, the flower base being conical, rounded and smooth. About 10 vascular bundles in depressed scar. Treatment with alkali gives a yellow extract.

Microscopical: Petals containing a network of fine, spirally thickened vessels. Filaments and anthers with papillose epidermis. Pollen grains spherical, with a dense, granular exine and about a dozen circular pores, about 150 μm in diameter.

U.S.D., 22nd Edn., p. 242-3.

THERAPEUTICS

Action: Astringent. Anti-haemorrhagic.

Indications: Colitis. Diarrhoea. Prostatic hypertrophy.

Preparations and Dosage: (thrice daily)

Dried flowers. Dose 0.3-1 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.3-1 ml.

***Note:** *OPUNTIA* (Cactus Flowers) should not be confused with the flowers of *Selenicereus grandiflorus*, a native of the West Indies.

PANAX

SYNONYMS

Ginseng; Schinsent; Ninjin; Jintsam.

DEFINITION

Panax consists of the roots of *Panax schinseng* Nees (*Panax ginseng* CA Meyer), (Fam. Araliaceae). It is indigenous to Eastern Asia and is cultivated in China, Korea and Japan. It contains steroidal glycosides known as panaxosides or ginsenosides which on extraction or drying may be hydrolysed and the aglycones converted to panaxadiols and panaxatriols.

Martindale 27th Edn., p. 1763. Merck Index 9th Edn., 4256.

DESCRIPTION

Macroscopical: Fusiform or cylindrical pieces 6-10 cm long and 0.5-2 cm wide. Externally light-yellow-brown, annular in the upper portion, terminated at the crown by one or more stem scars. Lower portion longitudinally wrinkled and marked by a number of root scars. Fracture short, internal surface light yellow-brown, marked by a distinct brown cambium line, radiate wood, oil secretion canals in the cortex. Odour slightly aromatic; taste initially sweet and then slightly bitter.

Microscopical: Pale yellow-brown powder consisting of oval parenchymatous cells packed with starch grains 0.5-1 μm in diameter and occasional cluster crystals of calcium oxalate. Yellow-brown resinous canals and rectangular cells of medullary rays. Spiral and reticulate vessels slightly lignified; fragments of polygonal cork cells.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Thymoleptic. Sedative. Demulcent. Stomachic. Reputed to be aphrodisiac.

Indications: Neurasthenia. Neuralgia. Insomnia. Hypotonia.

Specific Indication: Depressive states associated with sexual inadequacy.

Combinations used: May be combined with *Turnera* and *Serenoa* in glandular weakness.

Preparations and Dosage: (thrice daily)

Dried root. Dose 1-2 g or by decoction.

PARIETARIA

SYNONYMS

Pellitory-of-the-wall, *Parietaria officinalis*.

DEFINITION

Parietaria consists of the dried aerial parts of *Parietaria diffusa* Mert. & Koch (Fam. Urticaceae) collected during the flowering period. The plant is a perennial herb native to Britain, spreading or decumbent with slender lanceolate to ovate leaves and unisexual flowers, female flowers terminal, male flowers lateral.

Parietaria contains a bitter principle and tannins.

DESCRIPTION OF CUT HERB

Macroscopic: Leaf pieces wrinkled and rolled, dark green, some showing thick white veins. Stem pieces ridged, hollow, perhaps split, green to brown. Occasional flower pieces and black seeds 0.5 mm diameter. Odour and taste slight.

Microscopic: Covering trichomes unicellular slender and pointed, very birefringent. Glandular trichomes occasional, over veins, with short unicellular stalks and multicellular head of 4 to 6 small rounded cells. Leaf epidermis with sinuous anticlinal walls, some underlying cells containing non-birefringent granular cystoliths of calcium carbonate. Stomata anomocytic, mainly in lower epidermis. Calcium oxalate rarely in leaves but large numbers of small scattered clusters in flower parts. Pollen grains spherical, with a smooth exine, about 18-25 μm in diameter.

Total Ash: Not more than 16%.

Acid Insoluble Ash: Not more than 2.5%.

THERAPEUTICS

Action: Diuretic. Demulcent.

Indications: Dysuria with cystitis. Pyelitis. Oedema of renal origin. Oliguria. Urinary gravel or vesical calculi.

Specific Indications: Recurrent cystitis with urinary lithiasis.

Combinations used: Combines well with *Aphanes*, and/or *Arctostaphylos*, *Agathosma*, *Juniperus*.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-5 g. Liquid Extract 1:1 in 25% alcohol. Dose 1-5 ml.

Tincture 1:5 in 45% alcohol. Dose 2-10 ml.

PASSIFLORA

SYNONYMS

Passion Flower; Maypop; Grenadille.

DEFINITION

Passiflora consists of the dried aerial parts of *Passiflora incarnata* L. (Fam. Passifloraceae) gathered during the fruiting period. The plant is a native of North America.

Passiflora contains alkaloids, including harmine, and flavonoids
Martindale, 25th Edn., p. 1540.

DESCRIPTION OF CUT HERB

Macroscopical: Fragments of the three-lobed leaves, folded, thin, brittle, light green. Petioles about 1 mm in diameter, flattened, longitudinally wrinkled, brown, with two small, round, corky nectarial glands where they meet the upper surface of the leaf base. Tendrils, cylindrical strands less than 1 mm in diameter, coiled into cylinders, brown-buff-pale green. Stem pieces thick, pithy or hollow, with marked longitudinal striations, dull, pale green to buff. Seeds rounded, flattened, ovate, with a pitted surface, about 6 mm long, 4 mm wide and 2 mm thick, pale buff to grey to dark brown. Epicarp pieces of the succulent fruit, flattened, crumpled, thin, with a green-brown outer surface, and a whitish cream inner surface.

Microscopical: Leaf covering trichomes curved and pointed, uniseriate, of 1 to 3 cells, the terminal cell being comparatively long. Leaf epidermis with wavy-sinuous anticlinal walls. Stomata anomocytic, in the lower epidermis only. Tanniniferous sacs forming an angled margin to the leaf, multicellular, about 200 μ m in diameter, rounded, brown. Calcium oxalate clusters present in the leaf mesophyll, especially alongside the veins.

U.S.D., 22nd Edn., p. 1510.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Paper Chromatography: Lutomski (1959) Biul. Inst. Rosl. Leczn. 5 169, 182. Glotzbach & Rimpler (1968) Planta Med. 161.

Thin Layer Chromatography: Schilcher (1967) Dt. ApothZtg. 107 849. Glotzbach & Rimpler (1968) Planta med. 161.

THERAPEUTICS:

Action: Sedative and hypnotic. Antispasmodic. Anodyne.

Indications: Neuralgia. Generalised seizures. Hysteria. Nervous tachycardia. Spasmodic asthma.

Specific Indications: Insomnia.

Combinations used: May be used with Valeriana and Humulus for insomnia.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 0.25-1 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-1 ml. Tincture 1:8 in 45% alcohol. Dose 0.5-2 ml.

PETROSELINUM

SYNONYMS

Parsley Root; *Apium petroselinum* L.; *Carum Petroselinum* L. Benth., *Petroselinum sativum* Hoffm.

DEFINITION

Petroselinum consists of the dried roots of *Petroselinum crispum* (Mill.) Nyman (Fam. Umbelliferae), an annual or biennial herb indigenous to the Eastern Mediterranean but naturalised in most parts of Britain with the exception of Northern Scotland. Petroselinum contains a small amount of a volatile oil, a glycoside apiin and starch. Martindale 27th Edn., p. 1023.

DESCRIPTION

Macroscopical: Tap root fusiform, stout, yellow-white externally, up to 10 cm long and 1-2 cm wide; longitudinally wrinkled, occasional root scars; side roots 1-3 mm wide up to 5 cm long, tapering. Fracture sharp; bark thin, yellow; narrow radiate wood and a wide, soft, white pith occupying up to 90% of the total diameter of the tap root. Root often sliced into pieces 1-3 cm long and 0.5-1 cm wide to facilitate drying. Odour characteristic and faintly aromatic; taste faintly sweet.

Microscopical: Powder yellow-white; occasional rectangular epidermal cells; phloem parenchyma cells rectangular to oval; bundles of elongated phloem fibre cells; occasional starch grains, oval to circular up to 25 μ m in diameter; vessels lignified, long and narrow, annular or reticulate thickening; large oval cells of the pith comprise the bulk of the powder; calcium oxalate absent.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 1%.

Thin-Layer Chromatography: Klouwen, M. H. and Ter Heide, R. (1962), Parfumerie u. Kosm. 43, 195. Kasting, R. et al (1972) Phytochem 11 (7) 2277-2282.

THERAPEUTICS

Action: Carminative. Spasmolytic. Diuretic. Emmenagogue. Expectorant. Anti-rheumatic. Antimicrobial.

Indications: Flatulent dyspepsia. Tormina. Cystitis. Dysuria. Bronchitic cough in the elderly. Dysmenorrhoea. Functional amenorrhoea. Myalgia – internal and topical use.

Specific Indication: Flatulent dyspepsia with intestinal colic.

Combinations used: May be combined with Althaea Root, Melissa, Chamaemelum and Ballota in dyspepsia with nausea or vomiting; with Taraxacum, Berberis or Hydrastis in hepatic disease; with Agropyron Hydrangea, Agathosma in acute cystitis; with Chamaelirium, Pulsatilla and Viburnum Prunifolium in dysmenorrhoea.

Preparations and Dosage: (thrice daily)

Dried root. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

PEUMUS

SYNONYM

Boldo.

DEFINITION

Peumus consists of the dried leaves of *Peumus boldus* Molina (Fam. Monimiaceae) a dioecious evergreen tree indigenous to Chile. Peumus contains a volatile oil (2%) and a glycoside, boldoglucin (0.3%). Martindale 25th Edn., p. 1508. B.P.C. (1934) p. 224.

DESCRIPTION OF LEAVES

Macroscopical: Flat, simple, broken, with some entire leaves, 3 to 7 cm long and 2 to 3 cm broad, greyish-green, ovate or oblong ovate, shortly petiolate, coriaceous and brittle; margin entire, slightly revolute; apex obtuse or slightly emarginate, mucronate; base equal, rounded; veins pubescent, prominent on lower surface, anastomosing towards leaf edge; upper surface coarsely papillose; both surfaces faintly pubescent. Odour aromatic, camphoraceous and pungent; taste aromatic and bitter.

Microscopical: Upper epidermis, sinuous thick walled cells with an underlying hypodermis of thick walled cells 1 to 3 cells deep; lower epidermis of sinuous thick walled cells; stomata anomocytic, confined to lower epidermis; covering trichomes thick walled, unicellular, each with a spiral band of thickening, some isolated, others in stellate groups of 4 to 8; palisade mesophyll with brown contents, 1 to 2 layers containing spherical oil glands; spongy mesophyll containing occasional cystoliths of calcium carbonate; calcium oxalate absent.

Deryng. p. 126. Flück *et al.* p. 124.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 6%.

Paper Chromatography: Krug, H. and Borkowski, B. (1965), Pharmazie., 20, 692-8.

THERAPEUTICS

Action: Chologogue. Liver stimulant. Sedative. Diuretic; mild urinary demulcent and antiseptic.

Indications: Gall-stones. Pain in liver or gall bladder. Cystitis. Rheumatism.

Specific Indications: Cholelithiasis with pain.

Combinations used: May be combined with Berberis, Chionanthus in the treatment of gall-stones or hepatic disease.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 60-200 mg or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 0.1-0.3 ml. Tincture 1:10 in 60% alcohol. Dose 0.5-2 ml.

PHYTOLACCA

SYNONYMS

Poke Root, Red Plant, Pocan. *Phytolacca decandra* L.

DEFINITION

Phytolacca is the dried root of *Phytolacca americana* L. (Fam. Phytolaccaceae), a large herbaceous perennial widely distributed in Eastern and Central North America and naturalised in Southern Europe. It is collected in the autumn. *Phytolacca* contains an alkaloid phytolaccine, phytolaccic acid, resins, tannins and sugars.

B.P.C. (1934), p. 802. Martindale, 26th Edn., p. 2032.

DESCRIPTION

Macroscopical: Chopped root, longitudinally split into pieces 1-4 cm in length, 0.5-1 cm in diameter. The outer surface yellowish, reddish or grey-brown, longitudinally wrinkled and marked with narrow transverse bars of cork; inner surface hard, light brown to cream; fracture fibrous, internal surface characterised by zones of fibro-vascular bundles alternating with rings of parenchymatous tissue. Odour slight; taste acrid. The root is powerfully sternutatory.

Microscopical: Dark yellow powder consisting of abundant, unligified, thick-walled fibres and large bordered pitted vessels, a few showing reticulate thickening; starch grains simple or compound 7-30 μm in diameter; raphides of calcium oxalate 15-40 μm in length, occasionally broken and appearing as micro-crystals; brown cork cells.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 6%.

Water Soluble Extractive: Not less than 20%.

Chromatography: Piatelli, M. and Minale, L. (1964), *Phytochemistry*, 3, 547.

THERAPEUTICS

Action: Antirheumatic. Anticatharrhal. Mild anodyne. Emetic and purgative in large doses. Parasiticide. Fungicide.

Indications: Chronic rheumatism. Chronic respiratory catarrh. Tonsillitis. Laryngitis. Adenitis. Mastitis. Mumps. Externally – as ointment in scabies, tinea, sycosis, acne; as poultice in mammary abscess, mastitis.

Specific Indications: Inflammatory conditions of the upper respiratory tract. Lymphatic adenitis.

Combinations used: May be combined with *Guaiacum* and *Zanthoxylum* in rheumatic conditions; with *Commiphora Resin* and *Echinacea* in tonsillitis; with *Galium* and *Iris* in lymphadenitis.

Preparations and Dosage: (thrice daily)

Dried root. Dose 0.06-0.3 g or by decoction. Liquid Extract 1:1 in 45% alcohol. Dose 0.1-0.5 ml. Tincture (B.P.C. 1923), 1:10 in 45% alcohol. Dose 0.2-0.6 ml.

PICRASMA

SYNONYMS

Quassia; Quassia Wood; Jamaica Quassia, *Picraena excelsa*.

DEFINITION

Picrasma consists of the dried stem-wood of *Picrasma excelsa* (Sw.) Planch. (Fam. Simarubaceae), a tree growing up to 10 metres in height in the West Indies. Commercial samples of *Picrasma* are obtained from Jamaica. The branches and trunk are freed of bark, cut in transverse chips and dried. *Picrasma* yields 0.2% of bitter principles containing quassin, neo-quassin and a yellow crystalline substance.

B.P.C. (1973), p. 422. Martindale 27th Edn., p. 256.

DESCRIPTION

Macroscopical: Chips and transverse slices, yellow to pale cream in colour, diffuse porous, false annual rings, easily split longitudinally, tangential surface ridged or rippled. Odourless; taste bitter.

Microscopical: Light yellow-buff powder; vessels lignified, groups of up to 12, minutely border-pitted; xylem fibres up to 1 mm long, moderately thick walls, simple slit-like pits; xylem parenchyma in tangential bands up to 14-15 rows wide; axial parenchyma cells containing prismatic crystals of calcium oxalate 12-40 μ m long. Medullary rays storied, 2-4 cells wide, some cells containing calcium oxalate prisms; starch grains simple, spherical, occasionally compound, 4-12 μ m in diameter, occur in cells of the parenchyma and medullary rays.

Jackson & Snowdon, p. 4.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 4%.

Bitterness: Complies with the test for bitterness of the B.P.C. (1973), p. 422.

THERAPEUTICS

Action: Bitter. Orexigenic. Sialogogue. Gastric stimulant. Anthelmintic.

Indications: Anorexia. Dyspepsia. Nematode infestation – as enema and by mouth.

Topically: Pediculosis, as lotion.

Specific Indications: Atonic dyspepsia with loss of appetite.

Combinations used: May be combined with Chamaemelum and Lappa Root in anorexia nervosa; used with Althaea Root, Filipendula, and Humulus in nervous dyspepsia.

Preparations and Dosage: (thrice daily)

Dried wood. Dose 0.3-0.6 g or by cold infusion. Conc. Infusion B.P.C. (1959). Dose 2-4 ml. Tincture B.P.C. (1948). Dose 2-4 ml. Enema for rectal administration – infusion in cold water 1:20.

PILOSELLA

SYNONYMS

Mouse-ear; Mouse-ear Hawkweed; *Hieracium pilosella* L.

DEFINITION

Pilosella consists of the dried plant of *Pilosella officinarum* C. H. & F. W. Schulz (Fam. Compositae), a stoloniferous, scapigerous herb up to 30 cm in height, indigenous to the British Isles, Europe and Western Asia. *Pilosella* consists largely of leaf and contains the coumarin umbelliferone present predominantly as the 7-glucoside, the flavone luteolin and its 7-glucoside and other flavonoids, caffeic acid and chlorogenic acid.

DESCRIPTION

Macroscopical: Pieces of rhizome dark-brown, up to 4 mm wide, longitudinally striated and knotty with wiry roots, up to 1 mm in diameter, attached to the lower surface. Stolons yellow-green to brown, hollow, longitudinally striated. Leaf fragments with entire margin, upper surface dark-green to brown with long, stiff, white to brown hairs, lower surface pale-green to white and floccose to tomentose with prominent veins. Achenes 2 mm, purple-black. Odour faint; taste slightly aromatic.

Microscopical: Powder light green, fibrous; dorsiventral leaf with up to three layers of palisade cells, upper and lower epidermis with straight or slightly wavy anticlinal walls; stomata on both surfaces anomocytic, more abundant on upper surface; trichomes on upper surface multicellular, multiseriate and colourless to brown, showing small spines at intervals formed by exsertion of the ends of the outer cells, this trichome type particularly abundant near leaf bases; mesophyll cells containing globular masses; abundant stellate trichomes on lower leaf surface; multicellular uniseriate trichomes, with the terminal cell accounting for more than half the length, present on leaf bases. Sclereids, derived from testa of achene, in groups with simple pits. Epidermal cells of stolon straight or slightly wavy, underlying vascular tissue with lignified spiral, reticulate and bordered pitted vessels. Rhizome fragments, thin outer layer of brown tabular cork cells, ring of vascular strands of lignified vessels with spiral or reticulate thickening and bordered pits, pith parenchyma with thick walls. Pollen with spiky exine up to 25 μ m in diameter.

Chromatography: Haag-Berrurier, M. & Duquenois, P. (1963) Compt. Rend. 257, 3239. Duquenois, P. (1965) Mem. Soc. Bot. Fr. 41.

THERAPEUTICS

Action: Spasmodic. Expectorant. Anticatarrhal. Diuretic. Sialogogue.

Topically: Vulnery.

Indications: Bronchitis. Bronchitic asthma. Whooping cough. Haemoptysis. Oedema.

Topically: Herniae and fractures as lotion or compress.

Specific Indications: Whooping cough. Pulmonary affections with excessive sputum, soreness and haemoptysis.

Combinations used: Combines well with Marrubium, Verbascum, and Tussilago in whooping cough; with Drosera, Grindelia, Euphorbia or Senega in asthma.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. May be sweetened with honey. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Syrup. 6% in Simple Syrup. Dose 10-20 ml.

PIMPINELLA

SYNONYMS

Aniseed; Anise; Anisum; Anisi Fructus.

DEFINITION

Pimpinella is the dried ripe fruits of *Pimpinella anisum* L. (Fam. Umbelliferae). It is an annual herb, cultivated in many countries but indigenous to Turkey, Greece and Egypt. Pimpinella contains 1.5-4% of volatile oil, about 80% of which is the terpene anethole together with anisaldehyde, anise ketone, chavicol methyl ether, other terpenes and a sulphur containing compound.

B.P. (1980) Vol. 1, p. 37. Martindale 27th Edn., p. 1012.

DESCRIPTION

Macroscopical: Normally entire cremocarps with a slender pedicel attached, grey-green to brown in colour, ovoid, laterally compressed, pubescent; primary ridges, pale in colour, slender and of uniform width. Transverse section of each mericarp, 30-50 vittae on the dorsal surface, two large vittae on the commissure; commissural surface of endosperm not deeply grooved. Odour characteristic; taste sweet and aromatic.

Microscopical: An olive-brown powder, fragments of epicarp with evenly thickened and pitted walls, scattered anomocytic stomata and a strongly striated cuticle; covering trichomes, unicellular, thick-walled, warty 20-100 μm long and 15-40 μm wide at the base. Numerous fragments of brown vittae composed of thin-walled cells, septate, frequently branched. Sclereids of the mesocarp, frequently in groups, rectangular with a long lumen; tangentially elongated cells of the endocarp; endosperm of thick-walled cells containing microspheroidal crystals of calcium oxalate; aleurone grains sometimes containing a rosette crystal of calcium oxalate.

Jackson & Snowdon, p. 122.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2.5%.

Foreign Organic Matter: Not more than 2%.

Other Fruits and Seeds: Not more than 2%.

Volatile Oil: Not less than 2.0% v/w.

Thin-Layer Chromatography: Betts, T. J. (1964) J. Pharm. Pharmac., 16 S, 131.

THERAPEUTICS

Action: Expectorant. Spasmolytic. Carminative. Parasiticide.

Indications: Bronchial catarrh. Pertussis. Spasmodic cough. Flatulent colic. Topically: Pediculosis. Scabies.

Specific Indications: Bronchitis; tracheitis with persistent cough. Aromatic adjuvant to prevent tormina from cathartics.

Combinations used: Combines well with Mentha Piperita in flatulent colic, with Marrubium, Tussilago, Symplocarpus and Lobelia in bronchitis; with Prunus in tracheitis. The oil (1%) may be combined with oil of Sassafras (1%) in an ointment base for scabies.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 0.5-1 g or by infusion. Oil. Dose 0.05-0.2 ml. Spirit B.P.C. (1949). Dose 0.3-1 ml. Distilled Anise Water B.P.C. (1934). Dose 15-30 ml.

PIPER ANGUSTIFOLIUM

SYNONYMS

Matico; Matico Leaves *Artanthe elongata* Miq.; *Piper elongatum* Vahl.

DEFINITION

Piper Angustifolium consists of the leaves of *Piper angustifolium* R. and *P.* (Fam. Piperaceae), a shrub indigenous to Peru and Bolivia. *Piper Angustifolium* contains 2-3% of volatile oil the principal component of which is matico camphor, a bitter principle maticin, artanthic acid, tannin, mucilage and resin.

DESCRIPTION

Macroscopical: Leaves occur in large compressed, matted masses; individual leaves oblong-lanceolate 10-20 cms long, 2-5 cms broad; apex acute and tapering, base unequal, slightly cordate; petiole short; margin finely crenulate with broad truncate teeth; upper surface dark-green, papillose and hirsute; lower surface grey to green, markedly reticulate and hirsute; veins prominent, yellow-brown in colour. Odour strongly aromatic; taste pungent and pepper-like.

Microscopical: Grey-green powder; upper epidermis, slightly-wavy, to almost straight-walled epidermal cells, lower epidermis similar but exhibiting frequent anomocytic stomata; double layer of palisade cells often interrupted by resin glands containing yellow or brown masses; 1-10 celled non-glandular trichomes 0.2-1 mm in length, thick-walled; prisms of calcium oxalate in oval cells of the mesophyll.

Total Ash: Not more than 15%.

Acid Insoluble Ash: Not more than 6%.

Foreign Organic Matter: Not more than 5%.

THERAPEUTICS

Action: Astringent. Anti-diarrhoeal. Anti-haemorrhagic. Urinary antiseptic. Topically: Vulnerary. Styptic.

Indications: Diarrhoea. Mucous colitis. Inflammation of the urinary tract. Topically: Leucorrhoea. Haemorrhoids.

Specific Indication: Diarrhoea with general debility.

Combinations used: Combines well with Catechu, Geranium and Quercus in diarrhoea; with Agathosma, Agropyron and Hydrastis in bacterial cystitis.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 2-8 g or by infusion. Liquid Extract B.P.C. (1923). Dose 2-8 ml. Tincture 1:5 in 60% alcohol. Dose 4-8 ml.

PIPER METHYSTICUM

SYNONYMS

Kava; Kava-Kava; Kawa-Kawa; Methysticum.

DEFINITION

Piper Methysticum is the peeled, dried rhizome and root of *Piper methysticum* Forster (Fam. Piperaceae) a plant indigenous to, and cultivated in, the South Sea Islands from Hawaii to the East Indies. Piper Methysticum contains about 5% of a resin composed of a number of closely related 5,6-dihydro- α -pyrones, including yangonin, desmoethyl-oxy-yangonin, kawain, dihydro-kawain, methysticin and dihydromethysticin, together with two glycosides, mucilage and sugar.

B.P.C. (1934) p. 573. Martindale 27th Edn., p. 1772. Merck Index 9th Edn., 5158.

DESCRIPTION

Macroscopical: Irregular pieces of rhizome, transversely and longitudinally cut, 3-20 cm long, 1-10 cm in diameter. Light yellow-brown, longitudinally wrinkled with large, white, circular root scars. Fracture short and granular, inner surface yellow-white, bark thin, xylem distinctly radiate, pith large. Stem fragments narrower, up to 3 cm in diameter and hollow. Odour slight; taste sweet then pungent followed by a slight numbness.

Microscopical: Light yellow-brown powder, large oval cells of the pith; starch grains numerous spheroidal up to 45 μ m in diameter, 2-3 compound or single, hilum central and cleft. Secretion canals containing yellow to red-brown masses of resin; elongated cells of the medullary rays porous and slightly lignified. Vessels lignified, reticulate; fibres slightly lignified, large lumen and occasionally branched oval ends. Xylem parenchyma, cells lignified and slightly elongated. Calcium oxalate and cork absent.

Total Ash: Not more than 8%.

Identification Tests:

- (a) A drop of sulphuric acid applied to the powder on a tile produces a cherry-red colour.
- (b) Mount the powder in absolute alcohol and partially evaporate the solvent. Prismatic crystals of methysticin appear at the edges of the cover slip. These crystals polarise red-violet to yellow and dissolve in sulphuric acid with the formation of a violet solution.

Column Chromatography: Hansel, R. and Beiersdorff, H. A. (1955) *Arzneimittel-forsch* 9, 581-585.

THERAPEUTICS

Action: Antimicrobial. Diuretic. Spasmolytic. Sedative. Carminative. Topically: Rubefacient.

Indications: Cystitis. Urethritis. Rheumatism. Joint pains – topical application.

Specific Indication: Infection of genito-urinary tract.

Combinations used: Combines with Althaea Root, Apium and Agropyron in bladder disease: with Menyanthes, Cimicifuga and Apium in rheumatism.

Preparation and Dosage: (thrice daily)

Dried root. Dose 2-4 g or by decoction. Liquid Extract B.P.C. (1934). Dose 2-4 ml.

PISCIDIA

SYNONYMS

Jamaica Dogwood; Fish poison Bark.

DEFINITION

Piscidia is the root-bark of *Piscidia erythrina* L. (Fam. Leguminosae), a shrub in tropical America and the West Indies. It contains resins, piscidin, jamaicin, ichthyone, an isoflavonoid sumatrol and the rotenones lisetin, piscerythrone and piscidone.

B.P.C. (1934), p. 812.

DESCRIPTION

Macroscopical: Curved or channelled pieces 5-10 cm long and 2-6 cm wide. The outer surface is orange-brown where cork is present and grey-brown where it is exfoliated. Externally thin longitudinal ridges and fissures, inner surface red-brown and longitudinally furrowed. Fracture tough and fibrous. Odour faint; taste bitter and acrid.

Microscopical: Red-brown powder, pitted walled parenchymatous cells of the phloem, some containing spherical starch grains 1 μ m in diameter, singly or in groups of three or four. Lignified fibres, long, narrow, occur in bundles covered by regular cells containing a single prismatic crystal of calcium oxalate. Bundles of fibres interspersed with medullary ray parenchyma. Groups of lignified thick walled oval sclereids.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 3%.

THERAPEUTICS

Action: Sedative. Anodyne.

Indications: Neuralgia. Migraine. Insomnia. Dysmenorrhoea.

Specific Indications: Insomnia due to neuralgia or nervous tension.

Combinations used: Combines well with Humulus and Valeriana. Used with Viburnum Prunifolium in dysmenorrhoea.

Preparations and Dosage: (thrice daily)

Dried root-bark. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 30% alcohol. Dose 1-2 ml. Liquid Extract (B.P.C. 1934), 1:1 in 60% alcohol. Dose 2-8 ml.

PLANTAGO MAJOR

SYNONYMS

General Plantain; Common Plantain.

DEFINITION

Plantago Major consists of the dried leaves of *Plantago major* L. (Fam. Plantaginaceae) gathered during the flowering period. The plant is a native British herb, with a basal rosette of leaves which abruptly contract into long petioles, bearing a long cylindrical spike up to 50 cm tall, green-brown with lilac and yellow stamens protruding.

Plantago Major contains glycosides including aucubin; mucilage and ascorbic and protocatechuic acids.

Martindale, 25th Edn., p. 81.

DESCRIPTION OF CUT HERB

Macroscopical: Pieces of folded, brittle, dull grey-green leaves. Pieces of grooved, winged petioles.

Microscopical: Some covering trichomes, wide at the base, tapering to a narrow terminal cell, uniseriate, of about 4 cells, finely warted, sometimes partly collapsed and contorted. Many glandular trichomes with a short unicellular stalk and a head of 2 elongated cells. Epidermal cells with sinuous anticlinal walls, and on the upper surface, a rough, nodular, striated cuticle. Stomata anomocytic. Calcium oxalate absent.

Total Ash: Not more than 15%.

THERAPEUTICS

Action: Diuretic. Anti-haemorrhagic.

Indications: Cystitis with haematuria. Haemorrhoids.

Specific Indications: Haemorrhoids with bleeding and irritation.

Combinations used: Has been given with Symphytum Root, in gastric haemorrhage, and for haemorrhoids.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

PLANTAGO OVATA

SYNONYMS

Ispaghula: Spogel Seeds; Pale Psyllium Seeds.

DEFINITION

Plantago Ovata consists of the dried ripe seeds of *Plantago ovata* Forsk. (Fam. Plantaginaceae), an herbaceous annual growing in India and Iran. Plantago Ovata contains mucilage as the main constituent together with fixed oil, protein and a little starch.

B.P.C. (1963), p.410. Martindale 27th Edn., p.926.

DESCRIPTION

Macroscopical: Seeds about 1-3.5 mm long and 1-1.7 mm wide, ovate and boat shaped; pale grey-brown, with a faint pink tint and a red-brown oval spot on the convex surface and a brown hilum covered with a white membrane on the concave surface. Endosperm hard. Embryo straight, almost as long as the seed. Two cotyledons. The epidermis is mucilaginous and swells in water to form a translucent envelope. Odour slight; taste mucilaginous.

Microscopical: Pale brown powder. Epidermal fragments of polyhedral cells filled with a transparent mucilage and occasional small single or compound starch grains. Thick cellulose-walled cells of the endosperm with numerous large pits and granular contents. Thin-walled polyhedral cells of the embryo containing fixed oil and some aleurone grains.

Jackson & Snowdon p.102.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 3%.

Absorbency: Transfer 1 g of seeds to a 25 ml stoppered cylinder and fill to 20 ml mark with water. Shake occasionally during 24 hours and then stand for 1 hour. The swollen seeds occupy a volume of not less than 12 ml.

THERAPEUTICS

Action: Demulcent. Laxative.

Indications: Chronic constipation. Dysentery. Chronic diarrhoea. Cystitis. Topically: Furunculosis (poultice).

Specific Indications: Irritable bowel syndrome. Mucous colitis.

Combinations Used: May be combined with Ulmus as a poultice.

Preparations and Dosage: (thrice daily)

Seeds. Dose 5-10 g (3 g in children) taken after soaking several hours in warm water. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

PLANTAGO PSYLLIUM

SYNONYMS

Psyllium; Dark Psyllium; Flea Seeds.

DEFINITION

Plantago Psyllium consists of the dried ripe seeds of *Plantago psyllium* L. and of *Plantago arenaria* Waldst. and Kit. (Fam. Plantaginaceae). The plants are annual herbs grown in Southern Europe and North West Africa. Plantago Psyllium contains mucilage as the principal constituent, together with fixed oil, some protein and starch.

B.P.C. (1963), p.684. Martindale 27th Edn., p.929.

DESCRIPTION

Macroscopical: Seeds of *Plantago Psyllium* 2-3 mm long and 0.8-1.2 mm wide, oblong in outline, dark brown to almost red-black in colour with a glossy surface, translucent revealing a pale endosperm. Hilum, a pale area on the concave surface, a slight constriction across the convex surface. Embryo and endosperm similar to *Plantago Ovata*. Seeds of *Plantago arenaria* more elliptical in outline with a dull surface, not translucent, from 2-2.5 mm long and 1-1.5 mm wide.

Microscopical: A light brown powder having similar features to those of *Plantago Ovata*.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 3%.

Absorbency: When carried out as described for *Plantago Ovata* the seeds have a volume of not less than 14 ml.

THERAPEUTICS

Action: Demulcent. Laxative.

Indications: Chronic constipation. Dysentery. Chronic diarrhoea. Cystitis. Topically: Furunculosis (poultice).

Specific Indications: Irritable bowel syndrome. Mucous colitis.

Combinations Used: May be combined with *Ulmus* as a poultice.

Preparations and Dosage: (thrice daily)

Seeds. Dose 5-10 g (3 g in children) taken after soaking several hours in warm water. Liquid Extract 1:1 in 25% alcohol. Dose 2-5 ml.

PODOPHYLLUM

SYNONYMS

American Mandrake; May Apple Root.

DEFINITION

Podophyllum consists of the dried rhizome and roots of *Podophyllum peltatum* L. (Fam. Berberidaceae) a small herb with a long perennial rhizome, common in the Eastern United States of America and Canada. Rhizomes are collected in the autumn or late summer, cut into pieces and dried. *Podophyllum* contains the lignans, podophyllotoxin up to 1% and α - and β -peltatins. The drug also contains flavonoid glycosides, starch and resinous matter.

B.P.C. (1968), p. 638-9. Martindale, 26th Edn., p. 1632.

DESCRIPTION

Macroscopical: Occurs as dark reddish-brown, subcylindrical pieces, 8-12 cm long and 3-6 mm thick, smooth or slightly wrinkled longitudinally. Enlargements due to flowering stem scars are frequent on the upper surface as concave depressions surrounded by several circular leaf scars and on the under surface by root scars. Roots are cylindrical or flattened, about 1 mm thick. The rhizome breaks with a short fracture the surface is white showing a thin cork and a circle of oval vascular bundles. Odour faint but characteristic; taste bitter and acrid.

Microscopical: Powder is light brown, starch grains numerous, spheroidal and polygonal, from 3 to 25 μm in diameter, simple or 2 to 6 compound. Calcium oxalate in cluster crystals 60-100 μm in diameter. Spiral and pitted vessels, sclereids in groups 30-200 μm long. Fragments of brown cork cells and parenchyma containing starch.

Acid Insoluble Ash: Not more than 2.5%.

Thin Layer Chromatography: Kuhn, M. and von Wartburg, A. (1963), *Helv. Chim. Acta.* 46, 2127. von Wartburg, A., Kuhn, M. and Lichti, H. (1964) *Ibid.*, 47, 1203.

Test for Indian Podophyllum U.S.N.F. IX, p. 392.

THERAPEUTICS

Action: Powerful cathartic. Choleric. Sialagogue. Topical irritant.

Indications: Warts and corns – external application.
Constipation – small doses.

Specific Indication: Topical application for perianal warts.

Combinations used: Often combined with Taraxacum as laxative and cholagogue.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 0.12-0.6 g. Liquid Extract 1:1 in 90% alcohol. Dose 0.3-0.7 ml.

Note: The resin is cytotoxic and may be embryopathic. Podophyllum is not suitable for oral administration during the first trimester of pregnancy. It should not be taken if there is any debility.

POLYGONUM

SYNONYMS

Bistort Root; Great Bistort; Adderwort; English Serpentry.

DEFINITION

Polygonum consists of the dried rhizome and root of *Polygonum bistorta* L. (Fam. Polygonaceae), a tall perennial herb growing in Europe and Asia. Polygonum contains from 15-20% of tannins.

DESCRIPTION

Macroscopical: Sub-cylindrical pieces of rhizome 1-1.5 cm in diameter with dark-brown twisted wiry roots up to 1 mm in diameter; cut surface of rhizome pink in colour; thin layer of dark-brown cork, narrow white-grey cortex, circle of numerous small bundles, broad pith pink in colour. Taste astringent.

Microscopical: Powder greyish-pink; abundant starch present, simple grains 3-10-17 μm in diameter, mostly ovoid but some spherical granules with centrally placed hilum; lignified tracheids and vessels with spiral and reticulate thickening and with simple pits; phloem containing golden brown pigment; parenchyma containing starch and abundant cluster crystals of calcium oxalate 16-50-85 μm in diameter; tabular cork cells containing red-brown pigment.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Thin-Layer Chromatography: Gestirner, F. and Korf, G. (1966) Arch. Pharm. 299, 640.

THERAPEUTICS

Action: Astringent. Antidiarrhoeal. Anticatarrhal. Antihaemorrhagic. Demulcent. Mucilaginous. Anti-inflammatory.

Indications: Diarrhoea. Dysentery. Nasal catarrh. Cystitis. Mucous colitis. Pharyngitis (gargle). Stomatitis (mouth wash). Leucorrhoea (douche). Anal fissure (ointment).

Specific Indications: Diarrhoea in children.

Combinations used: May be combined with Geranium, Agrimonia, or Quercus in diarrhoea.

Preparations and Dosage: (thrice daily)

Dry rhizome. Dose 1.0-2.0 g in decoction or infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml. Tincture 1:5 in 25% alcohol. Dose 1-3 ml.

POPULUS

SYNONYMS

Quaking Aspen; White Poplar. *Populus Alba*.

DEFINITION

Populus consists of the dried bark of *Populus tremuloides* Michx (Fam. Salicaceae), a tree common in Great Britain and sometimes found in Europe. *Populus* contains populin, salicin and tannins.

DESCRIPTION

Macroscopical: Bark occurs as curved or flattened pieces up to 5 cm long and 0.3 cm thick, but is often shredded into fine fibres. Grey outer epidermis has been removed leaving a dull-brown surface with white areas due to deeper scoring on scraping; inner surface smooth and brown to almost white in colour. Fracture granular, exposing a white surface with two or three brown layers; inner portion fibrous. Odourless; taste bitter.

Microscopical: Pale cream to light brown powder. Abundant lignified septate fibres surrounded by a sheath of prismatic calcium oxalate crystals, lignified bordered pitted tracheids from traces of adhering xylem; unlignified medullary ray parenchyma, rows of pigmented parenchyma cells. Few lignified cork cells; starch absent.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Antirheumatic. Anti-inflammatory. Antiseptic. Astringent. Anodyne. Cholagogue.

Indications: Muscular and arthrodial rheumatism. Cystitis. Diarrhoea. Anorexia with stomach or liver disorders. Common cold.

Specific Indication: Rheumatoid arthritis.

Combinations used: May be combined with *Cimicifuga* and *Menyanthes* in rheumatoid arthritis. Used with *Berberis* and *Chelone* in anorexia with digestive weakness.

Preparation and Dosage: (thrice daily)

Dried herb. Dose 1-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

POTENTILLA

SYNONYMS

Common tormentil; *Potentilla tormentilla*.

DEFINITION

Potentilla consists of the dried rhizome of *Potentilla erecta* (L.) Rausch. (Fam. Rosaceae). The plant is a native British herb, up to 50 cm tall, upright, with silkily hairy, slender stems and leaves of three sharply toothed leaflets, bearing loose heads of four-petalled yellow flowers. Potentilla contains tannins and red colouring matter.

Martindale, 25th Edn., p. 1420.

DESCRIPTION OF CUT ROOT

Macroscopical: Irregular, partly cylindrical, gravel-like pieces of split rhizome, pinkish-grey, with areas of dark brown cork on outer surfaces, often annulated. Pieces of withered leaf vascular tissue, fine, branching strands less than 1 mm in diameter, pale yellow, some attached to the rhizome pieces. Taste astringent. Treatment with hot aqueous alkali extracts the red pigment.

Microscopical: (Powder) Brown cork cells. Xylem elements of the root fairly narrow, with spiral or reticulate thickening or bordered pits, very slightly lignified. (Leaf vascular tissue is highly lignified). Sclerenchymatous elements present, a few pitted fibres, in groups. Starch present as masses and single grains which are rounded or angularly elliptical in outline, about 2 to 18 μm long, some showing an elongated hilum, only slightly birefringent. Many calcium oxalate clusters, up to about 50 μm in diameter. Deryng., p. 106-7.

THERAPEUTICS

Action: Astringent. Anti-haemorrhagic. Topically: Styptic. Vulnerary.

Indications: Diarrhoea, acute or nervous. Ulcerative colitis. As a gargle and astringent for mucous membrane of throat and mouth. Used as a lotion for haemorrhoids, with Hamamelis Water.

Specific Indications: Diarrhoea.

Combinations used: In diarrhoea it combines well with Catechu Black, the action on the bowel being thereby prolonged.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-4 ml.

PRIMULA

SYNONYMS

Cowslip; Paigle; Peagle; *Primula officinalis* (L.) Hill.

DEFINITION

Primula consists of the dried flowers of *Primula veris* L. (Fam. Primulaceae), a common wild flower native in meadows and pastures throughout England, Europe and temperate Asia. Primula contains saponins, the sapogenins of which are based on the triterpene-aglycones priverogenin A and B, and about 0.1% volatile oil.

DESCRIPTION

Macroscopical: Flowers up to 2-3 cm long, often attached to a thin pedicel 2-6 cm long and 0.5 mm wide but may be detached. Calyx yellow-brown to green, campanulate, 10-15 mm long, 3-4 mm wide, finely pubescent, longitudinally striated when dry, teeth 2-3 mm long, ovate, obtuse and apiculate. Corolla tube about 10-15 mm long with five spreading lobes, folded at the mouth, yellow to yellow-green; lobes concave, notched and spotted yellow-orange at the base. Stamens 5, opposite the petals; ovary unilocular with a single style and stigma.

Microscopical: Yellow-green powder; fragments of corolla abundant, epidermis faintly striated and papillose, base of corolla showing elongated laticiferous cells with yellow contents. Epidermis of calyx with longitudinal cuticular striations, and anomocytic stomata: trichomes multicellular uniseriate with a unicellular glandular head; laticiferous cells in underlying layers. Fragments of anther showing fibrous layer, infrequent fragments of stigma with bulbous papillae. Pollen grains subspherical, of two different sizes, 18-25 μm diameter and 30-35 μm in diameter, exine finely pitted.

Thin-Layer Chromotography: Tschesche, R., Tijiong Tjoa, B., Wulff, G., (1966), Ann. Chem. 696, 160-179.

THERAPEUTICS

Action: Sedative. Spasmolytic. Hypnotic. Mild diuretic. Mild aperient.

Indications: Insomnia. Nervous excitability. Hysteria.

Specific Indication: Anxiety states associated with restlessness and irritability.

Combinations Used: May be combined with Humulus and Passiflora in insomnia; with Valeriana in hysteria; with Cypripedium and Scutellaria in anxiety states.

Preparations and Dosage: (thrice daily)

Dried flowers. Dose 1-2 g, as infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

PRUNUS

SYNONYMS

Wild Cherry Bark; Virginian Prune Bark.

DEFINITION

Prunus consists of the dried bark of *Prunus serotina* Ehrh. (Fam. Rosaceae), a tree widely distributed over North America especially throughout the Northern and Central States. Prunus is collected in the autumn and contains (+) – mandelo-nitrile glucoside (prunasin) together with an enzyme system which in the presence of water converts prunasin into benzaldehyde, hydrocyanic acid and glucose. Prunus also contains benzoic, trimethylgallic and paracoumaric acids, tannins, resins and a small amount of volatile oil. The bark yields 0.075-0.16% of hydrocyanic acid.

B.P.C. (1973), p. 534. Martindale 27th Edn., p. 616.

DESCRIPTION

Macroscopical: Irregular and varied fragments of bark, flat, curved or channelled, up to 12 cm long and 5 cm wide. Young bark covered with thin, smooth, glossy, red-brown cork, often interrupted by white tangentially-elongated lenticels; cork often exfoliated revealing smooth greenish-brown cortex. Old bark, darker and rough, inner surface brown and longitudinally striated, patches of narrow, lanceolate fissures about 1.0-5.0 mm long. Fracture short and granular, transverse surface with narrow band of cork, green cortex followed by pericyclic sclerenchyma and red-brown secondary phloem containing groups of sclereids and traversed by pale medullary rays. Odour slight; taste astringent and bitter, when wet recalling that of bitter almonds.

Microscopical: A light brown powder. Thin-walled elongated parenchyma cells of the phloem associated occasionally with thicker-walled cells of the medullary rays. Parenchyma cells contain clusters of calcium oxalate 10-30 μm in diameter, prisms of calcium oxalate 3-8 μm wide found scattered in the powder, rarely found inside cells. Starch granules spheroidal 5-9 μm in diameter, hilum distinct, smaller granules often found in medullary ray cells. Lignified fibres large and finely pitted; sclereids occur in dense groups, individually branched and elongated, finely pitted. Fragments of cork, thick-walled cells with dense brown contents, occasionally thin-walled in groups. Fungal hyphae frequently found associated with cork cells.

Jackson & Snowdon, p. 32.

Total Ash: Not more than 4%.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

Hydrocyanic acid: *Prunus* complies with the B.P.C. (1973), p. 535 test for hydrocyanic acid.

Paper Chromatography: Tantisewie, B., Ruijgrok, H. W. L., and Hegnauer, R. (1969) *Pharm. Weeblad.*, 104: 1341.

THERAPEUTICS

Action: Antitussive. Mild Sedative. Astringent.

Indications: Persistent cough. Pertussis. Nervous dyspepsia.

Specific Indications: Irritable and persistent cough of bronchitis. Pertussis. Cough due to increased irritability of respiratory mucosa.

Combinations used: May be combined with Tussilago, Marrubium and Urtica in pertussis; combines with Lactuca, Verbascum, Inula and Humulus in nervous cough. A combination with Althaea Root, Filipendula and Chamaemelum may be used in nervous dyspepsia.

Preparations and Dosage: (thrice daily)

Powdered bark. Dose 0.5-2 g or by infusion. Tincture B.P.C. (1949). Dose 2-4 ml. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml. Syrup B.P.C. (1973). Dose 2.5-10 ml.

Storage in airtight containers, free from moisture, protected from light.

PULMONARIA

SYNONYMS

Lungwort; Lungwort Herb.

DEFINITION

Pulmonaria consists of the dried leaf of *Pulmonaria officinalis* L. (Fam. Boraginaceae), indigenous to Great Britain.

DESCRIPTION

Macroscopical: Leaf coarsely chopped, larger pieces about 1 cm varying in colour from dark-brown to dark-green to pale-green, upper surface usually darker than lower, both surfaces with visible white spots and shiny bristle-like covering trichomes; leaf pliable to coriaceous with a papery fracture. Taste astringent.

Microscopical: Powder dark-green; dorsiventral leaf, upper epidermis with straight slightly wavy anticlinal walls; numerous epidermal cells in the form of papillae or conical trichomes mostly with $33\ \mu\text{m}$ base and $33\ \mu\text{m}$ in height, some elongated as covering trichomes up to 3 mm in length with thick walls and the surrounding epidermal cells also thick-walled; glandular trichomes with long unicellular stalks and unicellular glandular head and some with multicellular uniseriate stalks and unicellular oval-shaped glandular head particularly common near main veins; the white spotted areas on the leaf surfaces are large cicatrices having eight surrounding epidermal cells; lower epidermis with wavy anticlinal walls, slightly beaded; anomocytic stomata; trichomes same as upper epidermis.

Total Ash: Not more than 15%.

THERAPEUTICS

Action: Emollient. Expectorant. Astringent. Antihaemorrhagic. Topically: Vulnerary.

Indications: Bronchitis. Laryngitis. Nasal catarrh. Diarrhoea. Haemorrhoids. Wounds (topical application).

Specific Indication: Acute bronchitis with upper respiratory catarrh.

Combinations used: Combines with Marrubium, Tussilago, Lobelia and Capsicum in bronchitis; with Geranium, Agrimonia and Geum in children's diarrhoea; with Ranunculus and Calendula in haemorrhoids.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

PULSATILLA

SYNONYMS

Pasque Flower; Wind Flower; Prairie Anemone; Meadow Anemone.

DEFINITION

Pulsatilla consists of the dried aerial parts of *Anemone pulsatilla* L. and other species, (Fam. Ranunculaceae) collected while flowering. The plant is a perennial herb found in northern and central Europe and western Asia, up to 30 cm tall with a basal rosette of long stalked bipinnate leaves, leaflets also pinnately cut. Solitary violet-purple bell shaped flowers at the apex of the naked stems.

Pulsatilla contains a glycoside ranunculin in the *fresh* plant which is converted to the acrid volatile oil protoanemonin when the plant is crushed and in turn is converted to solid anemonin in the dried plant.

Martindale, 25th Edn., p. 1544. (B.P.C. 1934), p. 859.

DESCRIPTION OF CUT HERB

Macroscopical: Fragments of the leaves folded or rolled, thin, brittle, light green. Occasional fragments of sepals. Brown achenes present, covered in white hairs and with a dense white woolly plume about 1.5 cm in length. Hollow ribbed stem pieces yellow to green. Taste acrid.

Microscopical: Covering trichomes of leaves and sepals numerous, unicellular, thin walled up to 0.25 mm in length. Leaf epidermal cells with very sinuous anticlinal walls, anomocytic stomata confined to lower epidermis. Pollen grains spherical, faintly warted, about 30 μ m in diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 3%.

Water Soluble Extractive: Not less than 15%.

Chromatography: Saber, A.H., Mahran, E.H. & El-Alfy, T. (1968), *Planta Med.*, 16 231.

THERAPEUTICS

Action: Sedative. Analgesic. Spasmolytic. Bactericidal.

Indications: Dysmenorrhoea with scanty menses. Orchitis. Ovaralgia. Epididymitis. Tension headache. Hyperactive states. Insomnia. Boils. Skin eruptions associated with bacterial infection.

Asthma and pulmonary disease. Ear-ache (drops of tincture instilled into the auditory meatus).

Specific Indications: Painful conditions of the male or female reproductive system.

Combinations used: Combines well with Chamaelirium for dysmenorrhoea: with Passiflora for headache and nervous excitability: with Echinacea and Baptisia for skin disease and septicaemia.

Preparations and Dosage: (thrice daily)

Dried plant. Dose 0.12-0.3 g by infusion or decoction. Liquid extract 1:1 in 25% alcohol. Dose 0.12-0.3 ml. Tincture 1:10 in 40% alcohol. Dose 0.3-1 ml.

Note: The fresh plant should not be used.

QUERCUS

SYNONYM

Oak Bark.

DEFINITION

Quercus is the dried inner bark of *Quercus robur* L. (Fam. Fagaceae) and other species of *Quercus*. *Quercus* is a large tree indigenous to Europe and North America; it contains 15-20% of tannin consisting mainly of an amorphous phlobatannin which, when boiled with sulphuric acid, is converted to a red-brown phlobaphene known as oak-red. It also contains gallic acid and ellagitannin.

B.P.C. (1934) p. 869. Martindale 27th Edn., p. 218.

DESCRIPTION

Macroscopical: Cut pieces up to 2 cm long and 1 cm wide; externally bears silver-grey cork occasionally marked with brown lenticels; internally brown to red-brown and longitudinally striated; fracture fibrous. Odour none; taste astringent.

Microscopical: A red-brown powder, abundant lignified fibres with thick walls, narrow lumen and few pits, often surrounded by a sheath of prismatic calcium oxalate crystals. Groups of lignified thick-walled striated sclereids with a narrow lumen and branching pits; occasional groups of thin-walled simple-pitted sclereids with a wide lumen containing brown material. Prisms and clusters of calcium oxalate scattered in the parenchymatous tissue; phloem sieve tubes thin-walled with oblique ends. Fragments of red-brown cork slightly lignified.

Jackson & Snowdon, p. 22

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 1%.

Water Soluble Extractive: Not less than 10%.

THERAPEUTICS

Action: Astringent. Haemostatic. Antiseptic.

Indications: Diarrhoea. Haemorrhoids. Pharyngitis. Tonsillitis – as gargle. Topically: Haemorrhoids – as enema. Leucorrhoea – as douche.

Specific Indication: Acute diarrhoea, in frequent small doses.

Combinations used: Given with Zingiber or Capsicum, before meals.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

QUILLAJA

SYNONYMS

Quillaia Bark; Soap Bark.

DEFINITION

Quillaja consists of the dried inner bark of *Quillaja saponaria* Molina, and other species of *Quillaja* (Fam. Rosaceae), a tree cultivated in India but indigenous to South America. Quillaja contains saponin glycosides, quillaic acid and quillaia sapotoxin.

B.P. (1980) p.382 B.P.C. (1973), p.422. Martindale 27th Edn. p.325.

DESCRIPTION

Macroscopical: Pieces of bark, flat and hard 5-20 cm broad, 3-10 mm thick and of varying lengths. Outer surface red-brown to whitish with brown patches of outer bark; inner surface white to pale yellow, smooth and hard showing glistening points of calcium oxalate prisms. Fracture splintery and laminated; cut surface exhibits radial lines of medullary rays and tangential bands of phloem fibres. Odour faint, sternutatory; taste astringent and acrid.

Microscopical: A pinkish-buff powder. Occasional fragments of cork from the outer bark, red-brown and composed of irregular cells with moderately thick walls. Fibres occur singly or in intertwined groups, irregular in outline with thick lignified walls and an uneven lumen. Prismatic crystals of calcium oxalate 50 to 170 μm long. Large thin-walled sieve tubes and thin-walled phloem parenchyma occasionally containing a pale brown amorphous material or more frequently starch grains 5 to 20 μm in diameter. Medullary rays mostly 3 to 4 but may be up to 6 cells wide. Sclereids of two types, small, square to oval, thin-walled with numerous large pits and larger, irregular in outline with thick faintly striated walls and fewer pits.

Jackson and Snowdon, p.26.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 2%.

Outer Bark: Not more than 5%.

Alcohol (45%) Soluble Extractive: Not less than 22%.

THERAPEUTICS

Action: Mucosal irritant. Nauseant. Emulsifying agent. Expectorant.

Indications: Formerly used in early bronchial congestion.

Combinations Used: Combines with Marrubium, Pulmonaria, Hyssopus and Verbascum in bronchitis.

Preparations and Dosage:

Liquid Extract B.P.C. (1973). Dose 0.125 ml-0.25 ml. Tincture B.P. (1980), p.837. Dose 2.5-5 ml.

Note: Avoid large doses which may cause gastroenteritis.

RANUNCULUS

SYNONYMS

Pilewort; Lesser Celandine; Ficaria.

DEFINITION

Ranunculus consists of the dried herb *Ranunculus ficaria* L. (Fam. Ranunculaceae), a common Spring flowering perennial herb indigenous to Great Britain. *Ranunculus* contains anemonin and protoanemonin.

B.P.C. (1934), p. 465.

DESCRIPTION

Macroscopical: Leaves stalked, broadly ovate or reniform, glabrous, crenate, cordate at the base. Flowers on long peduncles, three sepals, eight to twelve bright yellow petals each with a nectary at the base. The leaves are less acrid than other species of the *Ranunculus*. Some roots enlarge to form tubercles which are acrid and bitter. Odour slight; taste slightly bitter.

Microscopical: A brown-yellow powder; leaf fragments, epidermis of very wavy-walled cells beaded near the margin; anomocytic stomata, trichomes and calcium oxalate absent. Elongated epidermal cells of stem with anomocytic stomata, reticulated unligified vessels. Fruits, wavy-walled elongated mesophyll cells, calcium oxalate prisms and fixed oil globules; roots, lignified fibres and reticulate vessels, elongated cork cells and numerous clusters of calcium oxalate; tubercles, large parenchyma cells packed with starch grains.

Total Ash: Not more than 16%.

Acid Insoluble Ash: Not more than 9%.

THERAPEUTICS

Action: Astringent. Locally demulcent.

Indication: Haemorrhoids.

Specific Indications: Internal or prolapsed piles with or without haemorrhage – by topical application as ointment or suppository.

Combinations used: May be combined with *Plantago Major* and *Calendula* for haemorrhoids. Combines with *Hamamelis* as suppository.

Preparations and Dosage: (thrice daily)

Dried plant. Dose 2-5 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-5 ml. Ointment 3% in suitable base.

Note: Ointment B.P.C. (1934) 30% fresh plant in benzoinated lard. Suppositories B.P.C. (1934).

RHAMNUS

SYNONYMS

Cascara; Cascara Bark; Rhamni Purshianae Cortex; Cascara Sagrada.

DEFINITION

Rhamnus is the dried bark of *Rhamnus purshiana* D.C., (Fam. Rhamnaceae), a tree indigenous to British Columbia, Washington, Oregon and North Carolina. Collection of bark is made in the early summer and dried. It should be stored for one year before use. Rhamnus contains cascariosides A and B ((+) and (-) isomers of 8-0-glucopyranosyl-barbaloin), cascariosides C and D (glucosides of chrysaloin) together with glycosides of emodin, emodin-oxanthrone and aloe-emodin. The bark contains not less than 8% of hydroxy-anthracene derivatives calculated as cascarioside A of which not less than 60% should be cascarioside calculated as cascarioside A.

B.P.C. (1973), p. 81. European Pharmacopoeia (1971) II, p. 355. Fairbairn, J. W. Evans, F. J. and Phillipson, J. D. (1977). J. Pharm. Sci. 66: 1300-1303.

DESCRIPTION

Macroscopical: Quilled, channelled and nearly flat pieces of bark 1-5 mm thick, but of various lengths and widths. Outer surface smooth, purple to brown cork bearing scattered lenticels, occasional patches of white lichen and small pieces of moss and liverworts; inner surface yellow to black, longitudinally striated and faintly corrugated transversely. Fracture short, fibrous on the inner surface. Cut surface exhibits narrow cork, yellow-grey cortex showing groups of sclerenchymatous cells, brown phloem traversed by medullary rays. Odour characteristic; taste bitter and persistent.

Microscopical: Powder yellow-brown, slender phloem fibres in groups accompanied by a sheath of prismatic calcium oxalate crystals; groups of lignified sclereids from the cortex; thin-walled sieve tubes with sieve plate on the oblique end walls; cluster crystals of calcium oxalate scattered throughout the parenchyma; parenchyma cells oval, containing a yellow substance; fragments of purplish cork cells.

Jackson & Snowdon, p. 8.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 1%.

Water Soluble Extractive: Not less than 15%.

Standards: Rhamnus complies with the tests for identification, chromatographic test and assay of the European Pharmacopoeia (1969), I p. 356-358.

THERAPEUTICS

Action: Mild purgative.

Indication: Constipation.

Combination used: Combines with Cassia Fruit, Berberis, Glycyrrhiza and Zingiber in constipation.

Preparation and Dosage:

Liquid Extract B.P. (1973). Dose 2-5 ml at bedtime.

Caution – excessive intake may result in hypokalaemia.

RHUS

SYNONYMS

Sweet Sumach; Fragrant Sumach; *Rhus canadensis* Marsh.

DEFINITION

Rhus consists of the root bark of *Rhus aromatica* Ait. (Fam. Anacardiaceae), a plant indigenous to Canada and the U.S.A.

B.P.C. (1934), p. 908. Martindale 27th Edn., p. 1807.

DESCRIPTION

Macroscopical: Bark, quilled or channelled pieces 1-4 cm long, 0.5-1.0 cm wide and up to 3 mm thick. Externally red-brown, exfoliated patches exposing a red-brown to white cortex. Cork rough, brittle, with scattered oval red-brown lenticels. Cortex waxy, longitudinally wrinkled. Inner surface light red-brown to cream, faintly longitudinally striated. Fracture granular, fractured surface showing a narrow cork, radiate rows of small oil cells, a broad cortex and phloem and narrow phelloderm. Odour slight; taste mucilaginous.

Microscopical: Cream-brown powder, large oval parenchyma cells of the phloem and medullary rays packed with groups of oval starch grains 2-10 μm in diameter; frequent clusters of calcium oxalate, some in excess of 100 μm in diameter; smaller cells of the cortex containing rosettes of calcium oxalate; dark masses of oil cells and frequent droplets of free oil; heavily lignified, oval to circular, thick-walled stone cells; bundles of lignified fibres, long, narrow and tapering, thick-walled with a narrow lumen, occasional masses of branched fibres exhibiting a crystal sheath of calcium oxalate prisms and clusters. Frequent masses of red-brown cork cells.

THERAPEUTICS

Action: Astringent. Reputed anti-hyperglycaemic action.

Specific Indications: Urinary incontinence of childhood and age.

Combinations used: Combines with Equisetum, Gentiana and Agrimonia in nocturnal enuresis; with Equisetum, Viburnum Opulus and Ephedra in urinary incontinence.

Preparations and Dosage: (thrice daily)

Dried root bark. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

ROSA

SYNONYMS

Rose hips; Hips.

DEFINITION

Rosa canina is the dried, ripe aggregate fruits of *Rosa canina* L. (Fam. Rosaceae), a shrub common throughout Europe including the British Isles. The fruit consists of an etaerio of achenes enclosed in the fleshy receptacle. *Rosa canina* contains ascorbic acid, citric acid, malic acid, vitamin A, riboflavine, nicotinic acid, sugar, mucilage, organic salts and about 2% of tannin.

B.P.C. (1954), p.655. Martindale 27th Edn., p.1697.

DESCRIPTION

Macroscopical: Fruits sub-globose, ovoid or ellipsoid, slightly flattened on top and tapering at the base, 1-2 cm long and 1-1.5 cm wide, scarlet, red-brown to yellow-brown. Outer surface of receptacle shiny, strongly wrinkled and crevassed in the dried fruits; scars of 5 calyx-teeth at the summit, surrounding the remains of the projecting styles and stigmas. Fracture short. Wall of the receptacle brittle, bearing on its inner, concave surface abundant bristle-like hairs and numerous small, hard achenes up to 5 mm long and 2 mm wide; achenes angular-ovoid, yellowish-white, hairy at the base and down one side, with a longitudinal groove running down the other side. Odour of fruit slight; taste sweet and then astringent.

Microscopical: Light orange-brown powder; abundant fragments of characteristic large unicellular trichomes from the inner epidermis of the receptacle and the epicarp of the achenes, walls heavily thickened and lignified and with a waxy cuticle which may be fissured. Inner epidermis of the receptacle composed of thin-walled cells containing cluster crystals, and occasionally prisms, of calcium oxalate and scattered isodiametric, lignified cells with thickened and pitted walls forming the trichome bases. Outer epidermis and middle layers of the receptacle of thick walled parenchymatous cells, those of the outer epidermis with orange-yellow contents and a thick cuticle. Achenes with epicarp composed of elongated cells with strongly thickened outer walls; sclerenchymatous fibres and stone cells of the mesocarp with strongly thickened walls and branched pits. Testa composed of polygonal cells with an underlying layer of elongated cells; thin-walled parenchyma of the endosperm and embryo containing oily droplets and aleurone grains.

Total Ash: Not more than 5%.

Acid Insoluble Ash: Not more than 1.5%.

THERAPEUTICS

Action: Astringent. Acidulous.

Indications: Gastritis. Diarrhoea. Polydipsia. Avitaminosis C.

Specific Indications: Dietary supplement as natural source of vitamin C, together with small amounts of A and B vitamins.

Preparations: Dried fruits, as infusion. Syrup of Rose Fruits.

ROSMARINUS

SYNONYM

Rosemary.

DEFINITION

Rosmarinus consists of the leaves and twigs of *Rosmarinus officinalis* L. (Fam. Labiatae), an evergreen shrub indigenous to Southern Europe and growing abundantly on the dry rocky hills of the Mediterranean region, flowers between April and June. Rosmarinus contains about 1% of volatile oil, known as Oil of Rosemary. This oil contains 2-5% of esters, mainly bornyl acetate, 10-18% of free alcohols including borneol and linalol. It also contains camphor, camphene and cineole.

Oil of Rosemary B.P.C. (1973), p. 432. Martindale 27th Edn., p. 1025.

DESCRIPTION

Macroscopical: Leaves linear to linear-lanceolate, 1-4 cm long, 2-4 mm broad, upper surface dark-green, lower surface green-grey and tomentose. Pieces of twigs up to 6 cm long and 1-2 mm wide, dark brown to black. Flowers, rare, blue, occur in false whorls but much broken in the herb. Odour characteristic; taste camphoraceous.

Microscopical: Grey-green powder; leaf-fragments, upper epidermis almost straight beaded anticlinal-walled epidermal cells, thick-walled oval cells of the hypodermis, elongated palisade cells. Lower epidermis, diacytic stomata, beaded epidermal cells; covering trichomes, multi-cellular much branched; glandular trichomes of two types, unicellular stalks and bicellular head, and trichomes with sessile multicellular encapsulated labiate oil glands. Fragments of dark-brown cork and bundles of lignified fibres and vessels from the stems.

Total Ash: Not more than 7%.

Acid Insoluble Ash: Not more than 1.5%.

THERAPEUTICS

Action: Carminative. Spasmolytic. Thymoleptic. Sedative. Diuretic. Antimicrobial.

Topically: Rubefacient. Mild analgesic. Parasiticide.

Indications: Flatulent dyspepsia associated with psychogenic tension. Headaches, migrainous or hypertensive.

Topically: Myalgia. Sciatica. Intercostal neuralgia.

Specific Indications: Depressive states with general debility and indications of cardio-vascular weakness.

Combinations used: May be used with Avena, Cola and Verbena in depression; with Salvia, Gelsemium and Valeriana in migraine.

Preparations and Dosage: (thrice daily)

Dried leaves and twigs. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 2-4 ml.

RUBUS

SYNONYM

Raspberry Leaves.

DEFINITION

Rubus consists of the dried chopped leaves of *Rubus idaeus* L. (Fam. Rosaceae), a small bush cultivated in most temperate countries. Rubus contains tannins together with polypeptides.

Beckett, A. H., Belthle, F. W., Fell, K. R. and Lockett, M. F. (1954) J. Pharm. Pharmacol., 6, 785. B.P.C. (1949), p. 772-3. Martindale 27th Edn., p. 1806.

DESCRIPTION

Macroscopical: Leaves pinnate with from 3-5 leaflets, 5-12 cm in length, the terminal leaflet somewhat longer than the others. Leaflets ovate to ovate-lanceolate, acuminate, rounded or subcordate at the base, irregularly dentate with mucronate teeth; green and pubescent on the upper surface, densely and closely white-tomentose on the lower surface. Petiole 2-7 cm long, cylindrical. Odour faint but characteristic; taste bland.

Microscopical: Powder grey-green, leaf fragments, upper epidermis slightly wavy-walled cells, irregularly thickened and beaded. Covering trichomes or the cicatrices where trichomes have been attached, frequent; stomata absent. Underlying palisade cells closely packed with occasional idioblasts containing clusters of calcium oxalate. Lower epidermis, cells smaller, slightly sinuous walls not thickened or beaded; numerous anomocytic stomata; covering trichomes, felted masses, unicellular, conical and much twisted with smooth and unlignified walls, a second type, less numerous, but longer, unicellular, conical, almost straight, tapering to the apex, walls thick and lumen absent at the base which is lignified and exhibits slight spiral markings. Occasional glandular trichomes, clavate with a short stalk and an ovoid multicellular head. Fibres and groups of vascular tissue from the veins and rachis; fibres lignified with few pits and thick walls, vessels lignified with annular or reticulate thickening. Occasional small subspherical pollen grains with an almost smooth exine.

Jackson & Snowdon, p. 72.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 1.5%.

Water Soluble Extractive: Not less than 15%.

Paper Chromatography: Marczal, G. (1963) Herba-Hung. 2, 343.

THERAPEUTICS

Action: Astringent. Partus praeparator, see Note.

Indications: Diarrhoea. Pregnancy. Stomatitis. Tonsillitis, as mouth wash. Conjunctivitis, as eye lotion.

Specific Indication: To facilitate parturition.

Combinations used: Combines well with Agrimonia and Geum in diarrhoea. Used with Salvia as mouth wash or gargle. Used with Euphrasia as eye lotion.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 4-8 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 4-8 ml.

Note: Burn, J. H. and Withell, E. R. (1941) Lancet, 2, 1.

RUMEX CRISPUS

SYNONYMS

Curled Dock Root; Yellow Dock Root.

DEFINITION

Rumex Crispus consists of the dried underground parts of *Rumex crispus* L. (Fam. Polygonaceae). The plant is a native British herb, up to 100 cm tall, with large lanceolate leaves having curled margins, bearing a lightly branched spike of small green three sided fruits with red tubercles.

Rumex Crispus contains hydroxyanthraquinone glycosides based on emodin and chrysophanol, and tannins.

DESCRIPTION OF CUT ROOT

Macroscopical: Light weight cut and split fragments of cylindrical outline, with grey-brown cork, yellowish cortex and pale, radially split wood. Treatment with aqueous alkali rapidly turns the fragments intense dark red.

Microscopical: (Powder): Cork cells brown. Xylem vessels reticulately thickened, unlignified. Starch grains polygonal-ellipsoid, 5 to 15 μm in diameter, and some larger grains about 30 μm in diameter. Calcium oxalate clusters, many, up to 55 μm in diameter. Sclerenchymatous elements, fibres in groups, some lignified.

U.S.D., 22nd Edn., p. 1556.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Gentle purgative. Cholagogue.

Indications: Chronic skin disease. Obstructive jaundice. Constipation.

Specific Indications: Skin disease especially psoriasis with constipation.

Combinations used: Often combined with *Taraxacum*.

Preparations and Dosage: (thrice daily)

Dried root. Dose 2-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

RUTA

SYNONYMS

Rue; Herby Grass.

DEFINITION

Rue consists of the dried herb *Ruta graveolens* L. (Fam. Rutaceae), a perennial undershrub indigenous to Southern Europe but often cultivated in Britain. Rue contains about 0.1% of a volatile oil, rutin, quercetin and sugars.

B.P.C. (1934), p. 912. Martindale 27th Edn., p. 1026.

DESCRIPTION

Macroscopical: Cut herb, leaves blue-green in colour, oblanceolate segments, wedge-shaped below, punctate, often broken into pieces 2-4 mm long, 2 mm wide; leaf fragments glabrous. Flowers occasional, green-yellow, petals concave and incurved at the tip; very occasional fruits, sub-cylindrical brown-green capsules 5-7 mm in diameter, rough externally and four or five-lobed at the apex. Stem cylindrical, branched and smooth 2-3 cm long and 1-3 mm wide. Odour strong and characteristic; taste pungent.

Microscopical: Grey-green powder; upper epidermis of leaf with large wavy delicately pitted walls, sinuous anticlinal walls on lower epidermis. Anomocytic stomata on lower surface only, parenchyma of mesophyll with large clusters of calcium oxalate and large internal oil glands; stem fragments, epidermis straight-walled cells, occasional stomata, elongated sieve tubes and parenchymatous cells; fragments of epidermis from corolla, straight anticlinal walls, pollen grains oval, three germinal pores 30-35 μ m in diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Thin-Layer Chromatography: Gänshirt, H. and Malzacher, A. (1960) *Naturwissenschaften*, 47, 279.

THERAPEUTICS

Action: Spasmolytic. Emmenagogue. Antitussive.

Indications: Atonic amenorrhoea.

Combinations used: May be combined with Chamaelirium and with Senecio Aureus in suppressed menses.

Preparations and Dosage: (thrice daily)

Powdered herb. Dose 0.5-1 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-1 ml.

SALIX

SYNONYMS

Willow; Willow Bark; Salicis Cortex.

DEFINITION

Salix consists of the bark of *Salix alba* L. (Fam. Salicaceae), and other species of Salix, notably *S. fragilis* L., *S. purpurea* L. and *S. pentandra* L. These species are trees indigenous to Britain and to Central and Southern Europe. Salix contains tannin and 2.5-11% salicin.

B.P.C. (1934), p. 918.

DESCRIPTION

Macroscopical: Bark occurs in thin channelled pieces about 1-2 cm wide and 1-2 mm thick. Outer surface glossy, smooth or slightly wrinkled longitudinally in young bark and dull or rugged in old bark, brown-grey to greenish in colour. Inner surface striated, fibrous and yellow-red or brown in colour. Fracture short in outer part and fibrous in the phloem. Transverse section exhibits numerous tangentially arranged groups of fibres. Odour slight; taste astringent and bitter.

Microscopical: Light brown powder, cork cells with thickened and suberised walls; oval parenchyma cells, devoid of starch but containing numerous clusters of calcium oxalate; long narrow bundles of lignified fibres surrounded by a crystal sheath containing prisms of calcium oxalate.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 1%.

Water Soluble Extractive: Not less than 10%.

Chromatography: Thieme, H. (1964) *Pharmazie*, 19, 471.

THERAPEUTICS

Action: Anti-inflammatory. Antirheumatic. Antipyretic. Antihidrotic. Analgesic. Antiseptic. Astringent.

Indications: Muscular and arthrodial rheumatism with inflammation and pain. Influenza and respiratory catarrh. Gouty arthritis. Ankylosing spondylitis.

Specific Indications: Rheumatoid arthritis and other systemic connective-tissue disorders characterised by inflammatory changes.

Combinations used: May be combined with *Cimicifuga*, *Apium* and *Guaiacum* in rheumatoid arthritis.

Preparations and Dosage: (thrice daily)

Dry bark. Dose 1-3 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-3 ml.

SALVIA

SYNONYMS

Sage; Red Sage.

DEFINITION

Salvia consists of the dried leaves of *Salvia officinalis* L. (Fam. Labiatae), a perennial herb growing up to 50 cm in height. *Salvia* is indigenous to Southern Europe and the United States, and yields 1-2.5% of volatile oil containing salvene, pinene, camphor, cineole, borneol, thujone, salvene esters and sesquiterpenes.

B.P.C. (1934), p. 921. Martindale 27th Edn., p. 1026.

DESCRIPTION

Macroscopical: Leaves oblong-lanceolate or ovate, 2-10 cm long and 1-2.5 cm broad; apex acute, base rounded or somewhat cordate, frequently lobed; margin crenulate; upper surface grey-green and pubescent when young, nearly smooth with a depressed midrib and veins when older; lower surface light green, prominent midrib, minutely reticulate and densely pubescent; petiole 1-5 cm long, upper side grooved, grey-purple. Odour aromatic; taste aromatic and bitter.

Microscopical: Dark green powder; epidermal fragments polygonal and thick-walled, stomata caryophyllaceous; covering trichomes long, narrow, uniseriate, 2-6 celled with thick walls and sharply acute apices; glandular trichomes of two types, 1-4 celled stalk and a mono or bicellular head, sessile rosette-shaped trichomes with 6-8 encapsulated cells.

Total Ash: Not more than 8%.

Foreign Organic Matter: Not more than 3%.

Thin-Layer Chromatography: Ruffini, G. (1965), J. Chromatography, 17, 483.

THERAPEUTICS

Action: Carminative. Spasmolytic. Antiseptic. Astringent. Antihidrotic.

Indications: Flatulent dyspepsia. Pharyngitis, uvulitis, stomatitis, gingivitis, glossitis – internally or as a gargle or mouthwash. Hyperhidrosis. Galactorrhoea.

Specific Indications: Inflammation of the mouth, tongue or throat, as a gargle or mouthwash.

Combinations used: Salvia may be combined with Potentilla and Gileadensis as a gargle in throat conditions. Combines with Filipendula and Chamaemelum in dyspepsia.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-4 g or by infusion. Liquid Extract 1:1 in 45% alcohol. Dose 1-4 ml.

SAMBUCUS

SYNONYM

Elder Flowers.

DEFINITION

Sambucus is the dried flowers of *Sambucus nigra*. L. (Fam. Caprifoliaceae), a small shrub indigenous to Europe, Western Asia and West Africa. Commercial samples are European, collected during early summer. Sambucus contains a trace of semi-solid yellow volatile oil, rutin, tannic acid and mucilage.

Martindale, 26th Edn., p. 267. B.P.C. (1934), p. 921. Merck Index, p. 918.

DESCRIPTION

Macroscopical: Shriveled and broken, small crumpled creamy-yellow masses, 1 mm to 3 mm in diameter. Calyx ovoid and corolla urn-shaped with five lobes, five stamens and a tri-locular ovary. Also present are flower buds and short pieces of stalk 1-2 cm long and 0.5-1 mm in diameter. Green leaf fragments about 2 by 4 mm are rare. Odour slightly aromatic; taste mucilaginous and faintly bitter.

Microscopical: Cream-yellow powder: contains numerous smooth spherical pollen grains, with three pores: pieces of corolla and calyx with infrequent stomata, mainly anisocytic, straight or slightly wavy-walled epidermal cells with a distinctive striated cuticle. Oil drops are present in the parenchymatous cells of the corolla. The calyx bears infrequent broad conical hairs. Fragments of brown cork and vascular tissue from the stem are present.

Deryng, p. 194. Flück, *et al.*, p. 102.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 20%.

Chromatography: Schmersake, K.J. (1964), *Naturwissen*, 51, 361.

THERAPEUTICS

Action: Diaphoretic. Anticatarrrhal.

Indications: Influenzal colds. Chronic nasal catarrh with deafness. Sinusitis.

Specific Indication: Common cold.

Combinations used: May be used with *Mentha Piperita* for colds and influenza. Combines well with *Millefolium* and/or *Hyssopus*.

Preparations and Dosage: (thrice daily)

Dried flowers. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

SANGUINARIA

SYNONYMS

Blood Root, Red Indian Paint.

DEFINITION

Sanguinaria is the dried rhizome of *Sanguinaria canadensis* L. (Fam. Papaveraceae). The herb is distributed through Canada and the United States of America. The rhizomes are collected in the autumn and dried. *Sanguinaria* contains alkaloids sanguinarine, chelerythrine, protopine and α - and β -homochelidonine, a red resin and starch.

B.P.C. (1934), p. 923-4. Martindale, 25th Edn., p. 691.

DESCRIPTION

Macroscopical: Occurs as dark grey or red-brown pieces 2-8 mm long and 5-15 mm thick, subcylindrical, slightly curved or straight and somewhat flattened. Surface bears incomplete encircling leaf-scars with traces of buds or aerial stem on the upper surface and numerous roots or root-scars on the lower surface. Roots are up to 1 mm thick, brittle and wiry. The fracture is short, the fractured surface orange-yellow with numerous deep red minute secretion cells and a dark brown cork. Odour slight; taste bitter and acrid.

Microscopical: The powder is reddish brown and sternutatory, ovoid starch grains numerous, 3-20 μm in diameter, mostly single but occasionally 2-3 compound; numerous fragments of red-brown resinous laticiferous sacs. Vessels few, narrow, with slit-like pits. Brown-black cork abundant.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Water Soluble Extractive: Not less than 15%.

THERAPEUTICS

Action: Expectorant. Spasmolytic. Emetic. Cathartic. Antiseptic. Cardioactive. Topical irritant. Escharotic.

Indications: Bronchitis, sub-acute or chronic. Asthma. Croup. Laryngitis, Pharyngitis. Deficient capillary circulation. Nasal polypus — as snuff.

Specific Indications: Asthma and bronchitis with feeble peripheral circulation.

Combinations used: Combines with Lobelia in bronchitic asthma. May be combined with Salvia and Capsicum as gargle in pharyngitis. Used with Chelidonium as topical application to warts and with Ulmus in chilblains.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 0.06-0.5 g. Liquid Extract 1:1 in 60% alcohol. Dose 0.06-0.3 ml. Tincture 1:5 in 60% alcohol. Dose 0.3-2 ml.

Emetic Dose: Rhizome 1-2 g. Liquid Extract 1-2 ml. Tincture 2-8 ml.

SANGUISORBA

SYNONYMS

Greater Burnet; Garden Burnet; Burnet.

DEFINITION

Sanguisorba consists of the dried aerial parts of *Sanguisorba officinalis* L. (Fam. Rosaceae). The plant is a native British herb up to 60 cm tall, upright and glabrous. Contains flavones, tannin and volatile oil.

Martindale 20th Edn., p. 881.

DESCRIPTION

Macroscopical: Leaflets with a serrate to serrate-dentate margin, veinlets terminating at the apex of serrations, mostly cordate at the base with long petioles, upper surface of leaflets darker green than lower surface, veins prominent on the lower surface. Stem pieces mostly about 0.5 cm in diameter and 5 cm in length, hollow, mostly green but sometimes purple near the basal attachment to the rhizome. Small amount of rhizome present up to 1.5 cm in diameter with aerial stem, attached on upper side and small roots underneath, outer red-brown cork, narrow light brown cortex, ring of paler xylem with porous wedges and large light brown pith. Flowers forming globose heads, green with a purple tinge; fruit green and four-angled up to 4 mm long.

Microscopical: Powder green-brown and fibrous; leaflets dorsiventral with two or more rows of palisade and a stellate spongy mesophyll; upper epidermis with beaded straight anticlinal walls; lower epidermis with slightly wavy beaded anticlinal walls and sunken actinocytic stomata; calcium oxalate clusters or rosettes, the majority less than 25 μm diameter, localised in the palisade mesophyll forming a partial crystal sheath along the top of the veins; veinlets terminate in the apex of the marginal serrations. Epidermis of the stem, elongated cells, sunken stomata forming longitudinal rows; much parenchyma, both lignified and non-lignified, the latter containing cluster crystals of calcium oxalate; associated lignified pitted small-lumen fibres up to 25 μm wide and lignified spiral reticulate and bordered-pitted vessels. Tabular brown cork cells of the rhizome; thin-walled and beaded parenchyma of the pith containing large clusters or rosettes of calcium oxalate, up to 90 μm in diameter; starch grains, simple or compound, with 2-5 components, up to 12 μm in diameter. Pieces of bracteole from the flowers with straight anticlinal walls bearing unicellular covering trichomes and glandular trichomes with multicellular uniseriate stalks and multicellular (usually two cells wide) glandular heads, bracteoles also containing calcium oxalate clusters or rosettes; pollen, up to 28 μm in diameter, with a grooved but otherwise smooth exine.

THERAPEUTICS

Action: Astringent. Antihaemorrhagic.

Topically: Styptic. Antihaemorrhoidal.

Indications: Diarrhoea. Ulcerative colitis. Metrorrhagia.

Specific Indications: Acute diarrhoea.

Combinations used: It may be used with *Potentilla* and *Catechu* in diarrhoea.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-6 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-6 ml. Tincture 1:5 in 45% alcohol. Dose 2-8 ml.

SASSAFRAS

SYNONYMS

Sassafras Root Bark; Saxifrax; Ague Tree; Cinnamon Wood; Saloop;
Sassafras varifolium (Salisb.) Kuntze, *S. officinale* Nees et Eberm.

DEFINITION

Sassafras is the dried inner bark of the root of *Sassafras albidum* (Nutt.) Nees (Fam. Lucraceae), a tree indigenous to the Eastern United States of America. Sassafras yields 3-9% of a volatile oil with saffrole as the major constituent (80-90%), other cinnamic acid derived compounds including sesamin, about 6% tannin, about 9% of a reddish-brown phlobaphene, resin and starch. Merck Index 9th Edn., 8137; Martindale 27th Edn., p. 1026; B.P.C. (1949), p. 789.

DESCRIPTION

Macroscopical: Irregular pieces curved and recurved, some channelled or quilled, 0.5-5 mm thick; outer surface rusty-brown and fairly smooth when deprived of most of the cork, otherwise with a wrinkled and grey surface with prominent root scars; inner surface darker in colour and longitudinally finely striated, rarely corrugated; fracture shortly fibrous. Odour strongly fragrant and aromatic; taste sweetish, somewhat mucilaginous, aromatic and astringent.

Microscopical: Red-brown powder; cork cells polygonal, lignified, with brown contents, rare; starch grains spherical or polyhedral, simple or 2-6 compound, individual grains up to 30 μm diameter in parenchymatous tissue; abundant small-lumen fibres singly or in groups, the majority 300-450 μm but up to 770 μm in length and 45 μm wide, many dentate due to adjacent medullary ray cells and with bifurcate ends, lignified with few distinct pits; pitted sclereids and lignified pitted parenchyma rare; yellowish-brown ceratenchyma associated with thin-walled parenchyma and medullary ray cells; large oil cells, thin-walled and ovoid to spherical, present in parenchyma; acicular crystals of calcium oxalate small and rare.

Jackson & Snowdon, p. 28.

Distinguished from Sassafras Stem Bark by rarity of cork, sclereids and epiphytes.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 5%.

Volatile Oil: Not less than 3%.

Foreign Organic Matter: Not more than 4% of wood.

Chromatography: Stahl, E. and Jork, H. (1969) Thin-Layer Chromatography, p. 230, Stahl, E. (Ed.) Springer Verlag. Hoeke, M. and Haensel, R. (1972) Arch. Pharm. 305, 33.

THERAPEUTICS

Action: Carminative. Diaphoretic. Diuretic. Dermatological agent. Anti-rheumatic.

Topically: Antiseptic. Pediculicide.

Indications: Cutaneous eruptions. Rheumatic pains. Gout.

Specific Indications:

Topically: Oil in pediculosis capitis.

Combinations used: May be combined with Lappa Root, Rumex Crispus and Urtica in eczema.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

Note: Oil is suitable only for topical use.

SCOLOPENDRIUM

SYNONYMS

Hart's-tongue Fern; *Scolopendrium vulgare*.

DEFINITION

Scolopendrium consists of the dried leaves of *Phyllitis scolopendrium* (L.) Newm. (Fam. Polypodiaceae). The plant is a native British fern with strap-like, entire leaves, cordate at the base.

Scolopendrium contains amino acids including α -methylglutamic acid.

DESCRIPTION OF CUT HERB

Macroscopical: Cut leaf pieces, folded, coriaceous, dull uniform green, the main veins forming parallel lines at about 60° to the midrib.

Microscopical: Covering trichomes irregular, multicellular and sometimes branched, uniseriate with some biseriate portions, including cells of different diameters. Glandular trichomes similar to the covering trichomes, but terminating in a small, brown unicellular head. Epidermal cells with sinuous anticlinal walls. Stomata anomocytic, large, about 65 μm long, in the lower epidermis only, with their long axis parallel to the main veins. Calcium oxalate absent. Sori rounded, about 150 μm in diameter, on some veins of lower surface. Spores slightly lobed irregular spheres with a finely pitted exterior, 20 to 25 μm in diameter.

Paper Chromatography: See Virtanen & Berg (1955) *Acta chem. scand.* 9 553.

THERAPEUTICS

Action: Mild astringent. It is reputed to exert an action on the spleen and liver.

Indications: Disorders of spleen. Mucous colitis.

Specific Indications: Splenomegaly, especially in blood dyscrasias.

Combinations used: Combines well with *Chionanthus*.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

SCOPARIUM

SYNONYM

Broom Tops.

DEFINITION

Scoparium consists of the dried tops of *Sarothamnus scoparius* (L.) Koch. (Fam. Papilionaceae) gathered when flowering. The plant is a native British shrub up to 200 cm tall, much branched and erect with glabrous, green, upright, 5 angled twigs with small, narrowly elliptic to obovate, acute leaves 5-10 mm long. Flowers large, golden yellow, two lipped.

Scoparium contains alkaloids, including sparteine, a glycoside scoparin, bitter principles and tannins.

Martindale, 25th Edn., p. 1547. B.P.C. (1923), p. 990. B.P.C. (1934), p. 939. B.P.C. (1949) p. 792. B.P. (1914), p. 337.

DESCRIPTION OF CUT HERB

Macroscopical: Dark yellow-green stem pieces, 1-3 mm in diameter, tough, flexible and glabrous, with 5 winged longitudinal ridges; transversely cut surface a regular pentagon with projections at angles. Very few, curled, simple leaflets. Black, flat, pieces of pod edged with brown hairs. Small amount of large pieces of white, woody, stem present. Taste bitter and unpleasant.

Microscopical: Epidermal cells of stem are rectangular to polyhedral, numerous anomocytic stomata between ridges, bundles of lignified fibres with thin walls and simple pits, associated with collenchyma and lignified parenchyma with tracheids and spirally thickened vessels. Numerous covering trichomes on both surfaces of the leaf, each with 2 basal cells and a strongly pointed terminal cell; epidermis of rectangular to polygonal cells with thick cuticle, slightly smaller than those of the stem, numerous anomocytic stomata on both surfaces. Calcium oxalate absent.

U.S.D., 22nd Edn., 1565-6.

Total Ash: Not more than 3%.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 9%.

Paper Chromatography: Schindler (1958) Dt. Apothztg., 98, 832.

THERAPEUTICS

Action: Cardioactive diuretic. Peripheral vasoconstrictor. Antihaemorrhagic.

Indications: Cardiac dropsy. Myocardial weakness. Tachycardia. Profuse menstruation.

Specific Indications: Functional palpitation with lowered blood pressure.

Combinations used: May be combined with Convallaria in treating oedema of cardiac origin.

Contra-indications: Inadvisable in pregnancy. Avoid in hypertension.

Preparations and Dosage:

Dried tops. Dose 1-2 g as decoction. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml. Tincture 1:5 in 45% alcohol. Dose 0.5-2 ml.

SCROPHULARIA

SYNONYM

Common Figwort.

DEFINITION

Scrophularia consists of the dried aerial parts of *Scrophularia nodosa* L. (Fam. Scrophulariaceae) collected when flowering. The plant is a native British herb, up to 80 cm tall, upright, with well toothed pointed oval leaves with clusters of small globular flowers with reddish brown upper lips.

Scrophularia contains saponins, hesperetin and cardio-active glycosides.

DESCRIPTION OF CUT HERB

Macroscopical: Fragments of green glabrous curled leaf pieces. Many bi-locular ovoid pointed fruit capsules about 4-5 cm long, often split open exposing brown seeds. Many stem pieces, smaller ones quadrilateral with brown to green exterior, larger pieces broken, showing white, pithy, interior.

Microscopical: Covering trichomes absent; many glandular trichomes with uniseriate stalks of 2-4 thin-walled faintly-warted cells and small unicellular heads. Leaf epidermal cells with a striated cuticle and sinuous anticlinal walls, especially on the lower surface. Stomata anomocytic, few in the upper epidermis. Calcium oxalate absent, but non-birefringent granular cell inclusions in the palisade layer. Pollen grains spherical, with smooth exine and 3 pores; about 20 μm in diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

THERAPEUTICS

Action: Dermatological agent. Mild diuretic. Increases myocardial contraction.

Indication: Chronic skin disease.

Specific Indications: Eczema. Psoriasis. Pruritus.

Combinations used: May be combined with Rumex Crispus in chronic skin disease.

Contra-indications: Avoid in ventricular tachycardia.

Preparations and Dosage:

Dried herb. Dose 2-8 g by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-8 ml. Tincture 1:10 in 45% alcohol. Dose 2-4 ml.

SCUTELLARIA

SYNONYMS

Skullcap; Hoodwort; Helmet Flower; Quaker Bonnet.

DEFINITION

Scutellaria consists of the dried aerial parts of *Scutellaria lateriflora* L. and other species (Fam. Labiatae) gathered during the late flowering period. The plant is a native of North America, with the calyx persisting around the fruits like a hood or bonnet. Scutellaria contains flavonoid glycosides including scutellarin.

Note: Scullcap is frequently adulterated or substituted at source with other species of labiates. Commercial material described in the present monograph is probably derived from a species of *Teucrium*.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments crumpled, with coarsely serrate margin, dark green on upper surface, paler green and hairy on lower surface. Fruits ellipsoid nutlets, with 2 adjacent flat faces and one rounded surface, dark brown, slightly pitted, about 2 mm long; sometimes remaining in groups of four enclosed by the persistent calyx, about 4 mm long, bonnet-like, ovoid-conical, with a narrow opening at the wider end bounded by 5 lanceolate lips, pale green. Stem pieces quadrangular, hollow and collapsed, longitudinally striated, dull green to brown. Taste bitter.

Microscopical: Covering trichomes long and narrow, uniseriate, up to 4 or more cells long, finely warted, often curved or flattened and twisted. Glandular trichomes of labiate type on a short stalk, with a small globular head of 2 or 4 cells. Leaf epidermis with very sinuous anticlinal walls. Stomata diacytic, closely packed, in the lower epidermis only. Calcium oxalate absent, but many tiny birefringent prisms of scutellarin in the leaf tissue.

U.S.D., 22nd Edn., p. 967-8.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 3%.

Water Soluble Extractive: Not less than 15%.

Paper Chromatography: Neu (1956) Z. Analyst. Chem. 151 328.

THERAPEUTICS

Action: Anti-convulsive. Sedative.

Indications: Epilepsy. Chorea. Hysteria. Nervous tension states.

Specific Indications: Grand mal.

Combinations used: Combines well with *Humulus* and/or *Passiflora*.

Preparations and Dosage: (thrice daily)

Dried plant. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

SENECIO AUREUS

SYNONYMS

Life Root Plant; Golden Senecio; Squaw Weed.

DEFINITION

Senecio Aureus consists of the dried herb of *Senecio aureus* L. (Fam. Compositae), a perennial herb indigenous to North America. It is reported to contain the alkaloids senecifoline and senecine, and resins.

Merck Index 9th Edn., 8196. Martindale 27th Edn., p. 1810.

DESCRIPTION

Macroscopical: Leaf and stem glabrous; leaves pinnatifid, dark green on upper and light green on lower surface with long petiole; stem dark brown with broad pith. Taste bitter.

Microscopical: Powder dark-green; dorsiventral leaf, upper epidermis with straight or slightly wavy anticlinal walls, one row of palisade cells; lower epidermis with wavy anticlinal walls and anomocytic stomata, mesophyll cells stellate; much vascular tissue from stem with circle of vascular tissue; lignified spiral and bordered-pitted vessels; lignified pith parenchyma with simple pits.

Total Ash: Not more than 20%.

Foreign Organic Matter: Not more than 10%.

THERAPEUTICS

Action: Uterine tonic. Diuretic. Mild Expectorant.

Indications: Functional amenorrhoea. Menopausal neurosis. Leucorrhoea (douche).

Specific Indication: Emotional and vascular instability, including the hot flush, associated with the menopause.

Combinations used: May be used with *Hypericum*, *Avena*, *Viburnum Prunifolium* and *Pulsatilla* in menopausal disturbances: with *Chamaelirium*, *Leonurus* and *Salvia* in delayed menses.

Preparations and Dosage: (thrice daily)

Dried herb 1-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-4 ml.

SENEGA

SYNONYMS

Snake Root; Rattlesnake Root; Polygala.

DEFINITION

Senega is the dried rootstock and roots of *Polygala senega* L. (Fam. Polygalaceae), and certain other closely related species cultivated in Western Canada and Japan. Senega contains saponins, senegin and polygalic acid, a trace of methyl salicylate and 5% of fixed oil.

B.P.C. (1973), p. 436. B.P. (1948), p. 463. Martindale, 26th Edn., p. 716.

DESCRIPTION

Macroscopical: Consists of a knotty root-stock 3-5 cm wide bearing the remains of aerial stems and buds with brown-purple scale leaves. A tortuous tap root descends from this, between 4 to 18 cm long, bearing lateral roots. There is a distinct keel following a spiral course, whilst the other convex side is transversely wrinkled. The fracture is short, the cut surface showing a thin cork, a brown bark and central white-yellow xylem traversed by medullary rays. Smooth transverse sections show wedges of parenchymatous medullary rays. Odour faintly aromatic; taste sweet then acrid. On chewing it has a sialagogic action. The powder is sternutatory.

Microscopical: Cream-brown powder consisting of parenchymatous cells containing oil drops but no starch or calcium oxalate. Xylem consists of pitted tracheids and pitted or reticulate vessels. Red-brown cork cells are abundant.

Jackson & Snowden, p. 186.

Acid Insoluble Ash: Not more than 2%.

Thin Layer Chromatography: Dungan, J.J. and de Mayo, P. (1964), Tetrahedron Letts. (37-38) 2567-60. Kila, J., Kuwa, H.A., Takido, M. and Kimura, Y. (1969), Yukugaku Zabshi (Japan), 1111-14.

THERAPEUTICS

Action: Expectorant. Diaphoretic. Sialagogue. Emetic.

Indications: Bronchitic asthma. Chronic bronchitis. Pharyngitis as a gargle.

Specific Indication: Chronic bronchitis.

Combinations used: Combines well with Euphorbia and with Grindelia in asthma and bronchitis.

Preparations and Dosage: (thrice daily)

Dried root. Dose 0.5-1 g or by infusion. Liquid Extract (B.P.C. 1968) 1:1 in 60% alcohol. Dose 0.3-1 ml. Tincture (B.P.C. 1968) 1:5 of Liq. Ext. B.P.C. in 60% alcohol. Dose 2.5-5 ml.

SERENOA

SYNONYMS

Saw Palmetto Berries; Sabal.

DEFINITION

Serenoa is the dried fruits of *Serenoa serrulata* Hook, f. (Fam. Palmae), a low scrubby palm growing in sandy soil from South Carolina to Florida. The fruits are collected from August to January and partly dried to a prune-like consistency. Serenoa contains about 1% of volatile oil in the pulp, steroids and fixed oil in the seeds, dextrose, resins and enzymes.

B.P.C. (1934), p. 913.

DESCRIPTION

Macroscopical: Drupe superior, ellipsoidal or globular, 1.5-3.0 cm long and 1.0-1.5 cm in diameter; externally brown to black, smooth, oily with a few large angular depressions due to contraction of inner layer on drying. Summit marked by the remains of the style and the base by a stem scar. Epicarp and sarcocarp forming a thin shell enclosing a hard thin endocarp externally red-brown and somewhat fibrous, inner surface smooth enclosing an ovoid, hard, anatropous red-brown seed, marked on the raphe side by an arillus-like appendage and on the opposite side, at one end, by the micropyle. Odour pronounced and aromatic; taste sweet, aromatic and slightly acrid.

Microscopical: Yellow-brown powder; fragments of sarcocarp, large cells containing yellow-brown or red-brown amorphous substance, often with epidermal cells attached. White fragments of endosperm, cell walls thickened and with large pores; occasional stone cells, nearly colourless, more or less tabular sometimes irregular in shape, up to 150 μ m long and 15 μ m thick showing numerous simple or branched pores, and polarising light with a distinct cross.

Moisture content: Not more than 15%.

Total Ash: Not more than 3%.

Acid Insoluble Ash: Not more than 1%.

Thin-Layer Chromatography: Haensel, R., Rimpler, H. and Schoepflin, G. (1964) *Planta Medica*, 12, 169.

THERAPEUTICS

Action: Diuretic. Urinary antiseptic. Endocrine agent. Anabolic agent.

Indications: Cystitis, chronic or sub-acute. Prostatic hyertrophy. Catarrh of genito-urinary tract. Testicular atrophy. Sex hormone disorders.

Specific Indication: Prostatic enlargement.

Combinations used: Used with *Turnera* and *Cola* in general debility and cachexia. Combines with *Equisetum* and *Hydrangea* in prostatic hypertrophy. May be used with *Agathosma* and *Parietaria* in genito-urinary affections.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 0.5-1 g or by decoction. Liquid Extract B.P.C. (1934). Dose 0.6-1.5 ml.

SMILAX

SYNONYMS

Sarsa; Sarsaparilla.

DEFINITION

Smilax consists of the dried root and rhizome of various species of *Smilax* (Fam. Liliaceae). The plants grow in Costa Rica, Mexico, Ecuador, Honduras, Peru and Jamaica. *Smilax* contains the saponins sarsaponin and parallin, which yield isomeric sapogenins, sarsapogenin and smilogenin. It also contains sitosterol and stigmasterol in the free form and as glucosides. B.P.C. (1949), p. 788. Martindale, 26th Edn., p. 726.

DESCRIPTION

Macroscopical: Bundles of roots and rhizomes from 60-70 cm long and 3-5 mm wide. Longitudinally wrinkled, reddish-brown or orange-brown in colour, fracture of cortex short and the centre fibrous. The transverse surface shows a white to white-brown cortex, a yellow lignified xylem and a pale central parenchymatous zone. Odourless; taste bitter.

Microscopical: A red-brown powder consisting of rectangular parenchymatous cells containing spheroidal starch grains up to 30 μm in diameter, which occur singly or in groups of 2-4. Calcium oxalate occurs in bundles of acicular crystals often embedded in mucilage in the parenchyma cells. Stone cells of the hypodermis are strongly lignified. Xylem consists of lignified vessels with spiral or reticulate thickening and bordered pitted tracheids. Lignified fibres are also present.

Jackson & Snowden, p. 186.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Water Soluble Extractive: Not less than 10%.

Thin Layer Chromatography: Elmunajjed, D.T., Fayez, M.B.E. and Radwan, A.S. (1965), *Phytochemistry*, 4 (4), 587-92. Bennett, R.D. and Heftmann, E. (1962). *J. Chromatography*, 9, 353-8.

THERAPEUTICS

Action: Antirheumatic. Antiseptic. Antipruritic.

Indications: Psoriasis and other cutaneous conditions. Chronic rheumatism. Rheumatoid arthritis. Leprosy — as an adjunct to other treatment.

Specific Indication: Psoriasis, especially with irritation and heavy desquamation.

Combinations used: May be combined with Lappa Root and Rumex Crispus in skin complaints.

Preparations and Dosage: (thrice daily)

Dried root. Dose 1-4 g or by decoction. Liquid Extract (B.P. 1898) 1:1 in 20% alcohol, 10% glycerol. Dose 8-15 ml.

STELLARIA

SYNONYM

Chickweed.

DEFINITION

Stellaria consists of the dried aerial parts of *Stellaria media* (L.) Vill. (Fam. Caryophyllaceae) collected during the flowering period. The plant is a native British herb with diffusely branched decumbent or ascending leafy stems. Flowers numerous with white petals longer than the sepals. *Stellaria* contains saponins.

DESCRIPTION OF CUT HERB

Macroscopical: Small green curled fragments of leaf. Many flower parts consisting of separate ovate-lanceolate pale green sepals 4.5-5.0 mm in length, in the form of a cup; pale brown petals occasionally found. The calyx often contains a capsule of reddish brown seeds about 1.0 mm in diameter. Seeds occasionally found loose in the cut herb. Stem pieces 1 mm in diameter, yellow-green, ribbed, hollow, flattened, frequently split open. Odour and taste very slight.

Microscopical: Leaf epidermal cells with very sinuous anticlinal walls. Stomata raised above the surface, anomocytic to diacytic. Covering trichomes uniseriate, about 6 cells long, with faintly warted thin walls, found mainly over the main veins and on the petioles of the leaves. Glandular trichomes uniseriate, with a stalk of about 9-10 cells and unicellular spherical head. Calcium oxalate in clusters, up to 60 μ m in diameter, found in the mesophyll of the leaves and sepals. Pollen spherical, about 40 μ m in diameter, with a faintly warted exine.

Total Ash: Not more than 18%.

Acid Insoluble Ash: Not more than 5%.

THERAPEUTICS

Action: Antirheumatic. Topically – Antipruritic. Vulnerary. Emollient.

Indications: Rheumatism. Topically – as ointment in eczema, psoriasis, indolent ulcer. As poultice for carbuncle or abscess.

Specific Indications: Topical application as an ointment in pruritic skin eruptions.

Combinations used: Combines well in ointment with root or leaf of *Althaea* and/or *Ulmus*.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-5 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-5 ml. Tincture 1:5 in 45% alcohol. Dose 2-10 ml. Ointment 1:5 in lard/paraffin base.

STILLINGIA

SYNONYMS

Queen's Delight; Queen's Root; Yaw Root.

DEFINITION

Stillingia consists of the dried root of *Stillingia sylvatica* L. (Fam. Euphorbiaceae), an herbaceous perennial indigenous to Virginia, Florida and Texas. The roots are collected in August, after removal of rootlets sliced and carefully dried. *Stillingia* contains 3-4% volatile oil, an acrid resin, an acrid fixed oil and 10-12% of tannin.

B.P.C. (1934), p. 1008.

DESCRIPTION

Macroscopical: Roots cylindrical and slightly branched, up to 40 cm long but usually cut or shredded into small pieces 2 cm long, 4-30 mm in width; externally dark-brown, longitudinally wrinkled, rootlets few; fracture fibrous internally; cork red-brown; inner bark light-red-brown sometimes whitish 0.5-4 mm thick, soft and spongy with numerous resinous cells which easily separate from the porous, radiate wood. Odour faint; taste bitter, acrid and pungent.

Microscopical: Light red-brown powder; starch grains 5-45 μm in diameter, single, spheroidal or of variable shapes with a central cleft. Tubular secretion cells containing red-brown amorphous resin. Vessels lignified, pitted, associated with xylem fibres. Bark fibres long, narrow, thick-walled and slightly lignified. Fragments of red-brown cork cells, rosette crystals of calcium oxalate in aggregates up to 70 μm in diameter.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Sialogogue. Expectorant. Diaphoretic. Dermatological agent. Astringent. Spasmolytic. Cathartic (large doses).

Indications: Bronchitis. Laryngitis. Laryngismus stridulus. Cutaneous eruptions. Haemorrhoids. Constipation.

Specific Indications: Exudative skin eruption with irritation and lymphatic involvement. Laryngismus stridulus.

Combinations used: May be combined with Lappa Root, Rumex Crispus, Iris Versicolor and Fumaria in cutaneous eruptions; with Lobelia, Sanguinaria, Pimpinella and *Eucalyptus globulus* in laryngismus stridulus and in bronchitis.

Preparations and Dosage: (thrice daily)

Dried root. Dose 1-2 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml. Tincture 1:5 in 45% alcohol. Dose 1-4 ml.

Note: Stillingia which has been stored for more than 2 years should not be used. Stillingia is a skin irritant, and the powder sternutatory.

SWERTIA

SYNONYMS

Chiretta; Chirata; Chirayta; Brown Chirata; White Chiretta; Ophelia chirata Griseb; East Indian Balmomy.

DEFINITION

Swertia is the dried plant *Swertia chirata* Buch.-Ham. (Fam. Gentianaceae), an erect annual herb indigenous to the mountainous district of Northern India. It is collected when in flower. Swertia contains two amorphous bitter principles, chiratin and ophelic acid, and xanthones. Tannins absent.

B.P.C. (1949), p. 234. Martindale 27th Edn., p. 254.

DESCRIPTION

Macroscopical: Pieces of stem, forming the major part of the drug, up to 1 cm diameter and 25 cm in length, yellowish-brown to purplish-brown colour, slightly winged, glabrous, lower part cylindrical and exhibits a narrow wood enclosing a wide yellowish pith which is easily separable, upper stem quadrangular bearing slender opposite branches attached at the leaf axils; the few leaves to be found are opposite and sessile, ovate or lanceolate with 5-7 prominent curving lateral veins, apex acuminate, margin entire, glabrous; flowers small and panicked; fruit is a bicarpellary, superior, ovoid, pointed capsule with persistent calyx; root scarce, frequently oblique with crown up to 12 mm in diameter. Odourless; taste intensely bitter.

Microscopical: Powder dark-brown; abundant pith parenchyma with simple pits, some parenchyma with pink-red contents, lignified vessels with bordered pits and with reticulate and spiral thickening, epidermal cells from stem with straight anticlinal walls and striated cuticle; dorsiventral leaf, upper epidermis papillose with straight or slightly wavy anticlinal walls, mesophyll with needle crystal inclusions, fine spiral vessels, lower epidermis papillose with wavy anticlinal walls and striated cuticle, stomata anomocytic and anisocytic on lower surface only; corolla with multicellular multiseriate trichomes up to 2 mm long; pollen 25-33 μ m in diameter, spherical, 3 pores, furrows with finely pitted exine; outer epidermal wall of capsule with pronounced reticulate cuticular striations, inner epidermal cells of capsule in parquetry arrangement; numerous seeds 270-550 μ m long and 150-450 μ m wide, irregularly ovoid and finely reticulate.

Acid Insoluble Ash: Not more than 1%.

Foreign Organic Matter: Not more than 5%.

Chromatography: Ghosal, S., Sharma, P. V. and Chaudhuri, R. K. (1975) *Phytochemistry*, 14, 2671.

THERAPEUTICS

Action: Orexigenic. Antimalarial.

Indications: Anorexia. Dyspepsia. Debility of convalescence. Gastro-intestinal atony. Reputed use in malaria.

Specific Indication: Anorexia associated with general debility.

Combinations used: May be combined with Berberis and Taraxacum in gall-bladder disease; combines well with other herbal remedies in convalescence, debility or loss of appetite.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 0.3-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture B.P.C. (1934). Dose 2-4 ml. Concentrated Infusion B.P.C. (1949). Dose 2-4 ml.

SYMPHYTUM LEAF

SYNONYMS

Comfrey Leaf; Knitbone; Consolida.

DEFINITION

Symphytum Leaf consists of the leaves of *Symphytum officinale* L. (Fam. Boraginaceae), an erect perennial herb growing in most damp areas of the United Kingdom. Symphytum leaf contains mucilage, tannin, allantoin, symphytine and echimidine.

B.P.C. (1934), p. 1036.

DESCRIPTION

Macroscopical: Leaves, upper surface dark-green, paler on the underside; obovate to lanceolate, 15-25 cm in length and 4-10 cms wide at the widest point. Margin entire, apex acute, base tapering, broadly decurrent, petiole stout. Both lamina surfaces sparsely pilose, venation reticulate and prominent on the lower surface. Odour none; taste sweet and mucilaginous.

Microscopical: Grey-green powder; epidermal cells of both surfaces with wavy anticlinal walls, often elongated on the lower surface over the prominent veinlets. Stomata anomocytic, more frequent on the upper surface. Trichomes unicellular, stiff, up to 2 mm in length, thick-walled with a well-defined lumen and pointed ends; trichomes of the lower surface with thinner walls; cicatrices of trichomes frequent, surrounded by 7-9 subsidiary cells. Vessels of the veins and stem narrow with annular or spiral thickening. Calcium oxalate absent.

Total Ash: Not more than 16%.

Acid Insoluble Ash: Not more than 5%.

Water Soluble Extractive: Not less than 15%.

Paper Chromatography: Tyrhak, E. (1963) Sci. Pharm., 81, 51-2.

THERAPEUTICS

Action: Vulnerary. Demulcent. Antihaemorrhagic. Anti-rheumatic. Anti-inflammatory.

Indications: Gastric and duodenal ulcer. Rheumatic pain. Arthritis.

Topically: as poultice or fomentation in bruises, sprains, athlete's foot, crural ulcers and mastitis.

Specific Indication: Gastric ulcer.

Topically: Varicose ulcer.

Combinations used: As for Symphytum root. For poultice, powdered leaf may be combined with Ulmus and Linum: for topical treatment of sprain, combines with Jacobaea and Sambucus nigra leaf.

Preparations and Dosage: (thrice daily)

Dried leaf. Dose 2-8 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-8 ml.

SYMPHYTUM ROOT

SYNONYMS

Symphytum Radix, Consolidae Radix, Comfrey Root.

DEFINITION

Symphytum Root is the dried root and rhizome of *Symphytum officinale* L. (Fam. Boraginaceae). It is a widely distributed perennial herb, cultivated in Britain and the United States, collected in spring or autumn. Symphytum Root contains 0.6-0.8% of allantoin, together with tannin, resin, gum, starch and sugars.

Martindale, 25th Edn., p. 1516. B.P.C. (1934), p. 1036.

DESCRIPTION OF THE ROOT

Macroscopical: Symphytum Root consists of pieces of dried root and rhizome about 10-40 mm in length and 5-15 mm thick. Externally it is deeply wrinkled longitudinally and black to brown-black in colour, sometimes exhibiting glistening crystals on the surface. The root is hard and brittle and the fracture is short, the fractured surface being pale cream in colour and horny. The transverse surface has a narrow bark separated by a dark cambium line from the radiate wood, which is comprised of bundles separated by wide medullary rays. Odour none; taste mucilaginous.

Microscopical: The powder is grey-white in colour and contains dark brown specks of cork. Symphytum powder consists largely of oval parenchymatous cells, often containing a few small spherical starch grains. Also present are masses of black cork fragments and pieces of lignified xylem tissue consisting of reticulate and pitted vessels.

Paper Chromatography: Tyrhak, E. (1963), *Sci. Pharm.* 31, 51-2.

Ash: Not more than 5%.

THERAPEUTICS

Action: Vulnerary. Cell-proliferant. Astringent. Antihaemorrhagic. Demulcent.

Indications: Gastric and duodenal ulcer. Haematemesis. Colitis. Topically — ulcers, wounds, fractures, herniae by application of fresh root preparation.

Specific Indications: Gastric ulcer. Topically — chronic varicose ulcer.

Combinations used: Combines well with Filipendula and/or Althaea in gastric ulcer. May be combined with Althaea for topical external application as an ointment.

Preparations and Dosage: (thrice daily)

Dried root and rhizome. Dose 2-4 g in decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Ointment Symphytum Root 10-15% extractive in usual type ointment base.

SYMPLOCARPUS

SYNONYMS

Skunk Cabbage Root; Skunkweed; Dracontium.

DEFINITION

Symplocarpus consists of the dried root and rhizome of *Symplocarpus foetidus* (L.) Salisb. (Fam. Araceae). The plant is a native North American perennial herb with a tuberous rootstock.

Symplocarpus contains volatile oil, resin and an acrid principle.

DESCRIPTION OF THE ROOT AND RHIZOME

Macroscopical: Whole root and rhizome. Large pieces of dark brown rhizome, up to 3 cm long and 2 cm in diameter, knotted and woody, bearing roots and root scars in circular depressions. Many unattached dark brown roots, transversely wrinkled, up to 0.3 to 0.5 cm in diameter and 8 cm long with a short fracture, white cross section with a small central stele.

Cut root and rhizome. Small white, irregular pieces of rhizome with dark brown cork adhering to the pieces from the outer pieces of the rhizome. Many lengths of shrivelled root, up to 3 cm, transversely wrinkled with dark brown cork, short fracture and white cross section with a small central stele.

Microscopical: Powder light brown. Many simple spherical starch grains, up to 10 μm in diameter, occasional compound grains with 2 to 8 components. Xylem elements fairly wide, with lignified reticulate thickening, isolated or in groups. Spherical thin-walled parenchyma cells, occasionally elongated with thin slightly lignified walls. Thin walled polygonal cork cells with red-brown contents. Many calcium oxalate needles, up to 60 μm in length, scattered and in idioblasts in the parenchyma.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 4%.

THERAPEUTICS

Action: Expectorant. Spasmolytic. Mild Sedative.

Indications: Bronchitis. Whooping Cough. Asthma.

Specific Indications: Bronchitic asthma.

Combinations used: Combines well with *Grindelia* and/or *Euphorbia* in the treatment of asthma and bronchitis.

Preparations and Dosage: (thrice daily)

Powdered rhizome or root. Dose 0.5-1 g. May be taken in honey or by infusion or decoction. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-1 ml. Tincture 1:10 in 45% alcohol. Dose 2-4 ml.

SYZYGIUM

SYNONYMS

Jambul; Jambula; Jamba; Java Plum; *Eugenia jambolana*.

DEFINITION

Syzygium consists of the dried fruits of *Syzygium cumini* L. (Fam. Myrtaceae). It is indigenous to the East Indies and India. The fruits contain volatile oil, fixed oil, resin, tannin and gallic acid.

Merck Index, 8th Edn., p. 594.

DESCRIPTION

Macroscopical: Hard, oval, red-brown to brown, inferior simple fruits 1-2 cm long and 0.5-1 cm wide, slightly tapering at the apex and bearing a small scar. The base is broader and tapers into a scar left by the pedicel. The pericarp is hard and brittle and the fruit contains a single oval brown-black seed. Odour pungent; taste sweet and bitter.

Microscopical: Powder red-brown consisting of fruit wall and seed fragments. The epicarp of the pericarp has regular polygonal cells, the epidermis heavily pigmented red-brown. Mesocarp cells thick walled and elongated, some circular oil glands with oil droplets. Endocarp consists of parenchymatous cells, groups of lignified spiral and reticulate thickened vessels. Bundles of lignified narrow lumen fibres and groups of stone cells with a pitted surface, elongated and occasionally branched at the ends. Seed tissue consists of large rectangular cells containing small oval starch grains 1-2 μm in diameter, some aleurone grains and occasionally a brown pigment, polygonal cells of testa and schizogenous oil glands containing oil droplets.

THERAPEUTICS

Action: Astringent. Carminative. Reputed hypoglycaemic.

Indication: Diarrhoea, with griping.

Combinations used: May be combined with *Quercus*, *Rubus* and/or *Acorus* in diarrhoea.

Preparations and Dosage: (thrice daily)

Dried fruits. Dose 0.3-2 g or by infusion or decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

TANACETUM

SYNONYMS

Tansy; *Chrysanthemum vulgare* (L.) Bernh.

DEFINITION

Tanacetum consists of the dried aerial parts of *Tanacetum vulgare* L. (Fam. Compositae). The plant, native to Great Britain and Europe, yields 0.2-0.6% volatile oil containing approximately 70% thujone and has been reported to contain an amorphous substance, tanacetin.

Merck Index 9th Edn., 8824. Martindale 24th Edn., p. 1391.

DESCRIPTION

Macroscopical: Coarsely powdered herb; dark green leaf fragments with serrate/sharply-toothed margin; stem with reddish-purple outer surface and inner white pith; numerous compositous flower heads with golden yellow tubular florets, involucre hemispherical, pale green to yellow-brown, glabrous ovate-lanceolate outer bracts, inner bracts narrower with scarious margins. Taste bitter.

Microscopical: Powder yellow-green; leaf isobilateral; upper epidermal cells with straight anticlinal walls and striated cuticle, stomata anomocytic, multicellular uniseriate glandular trichomes and sunken glandular trichomes with bicellular stalk and large unicellular glandular head predominantly collapsed; lower epidermal cells with wavy anticlinal walls, smooth cuticle, anomocytic or actinocytic stomata, trichomes as upper epidermis; stem tissue exhibiting a ring of lignified bordered-pitted and spiral vessels, broad lignified pitted pith parenchyma, epidermis with straight anticlinal walls and few glandular trichomes; microrosettes of calcium oxalate up to 5 μ m diameter from floret tissue; pollen with warty and finely pitted exine, three pores, up to 26 μ m diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Chromatography: Rufloff E. Von (1963). Can. J. Chem., 41, 1734.

THERAPEUTICS

Action: Vermifuge. Anthelmintic. Carminative. Spasmolytic. Stimulant to abdominal viscera.

Indications: Nematode infestation.

Topically: Scabies (as decoction). Pruritus ani (as ointment).

Specific Indication: Round or thread worm infestation in children (may be administered as enema).

Combinations used: May be combined with Ol. Ricini or used with Chamaemelum, Cassia Leaf, Artemisia Absinthium and Juglans in the treatment of Enterobius or Ascaris infestation.

Contra-indication: Avoid in pregnancy owing to the presence of thujone.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-2 ml.

TARAXACUM LEAF

SYNONYMS

Dandelion Leaf.

DEFINITION

Taraxacum Leaf consists of the dried cut aerial parts of *Taraxacum officinale* Wiggers (Fam. Compositae). The leaf is collected during May, and contains vitamin C together with flavonoids.

DESCRIPTION OF CUT LEAF

Macroscopical: Small leaf fragments 0.5-1.0 cm long and 0.5 cm wide, dark green or brown-green in colour, with a pronounced midrib. Frequent pieces of cut, broken midrib and stems 2 cm long, 0.5 cm wide, yellow-brown and sometimes purple. Cut pieces of root and rhizome may occur.

Microscopical: The powder is dark green and consists of leaf fragments with wavy-walled epidermal cells and a few anomocytic stomata. Calcium oxalate is absent, but narrow annular thickened vessels are numerous. Features of the root and rhizome may also be present.

Total Ash: Not more than 15%.

Acid Insoluble Ash: Not more than 3.5%.

Water Soluble extractive: Not less than 20%.

THERAPEUTICS

Action: Similar to *Taraxacum* Root but weaker.

Preparations and Dosage: (thrice daily)

Dried leaf. Dose 4-10 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 4-10 ml.

TARAXACUM ROOT

SYNONYMS

Dandelion Root.

DEFINITION

Taraxacum consists of the dried root of *Taraxacum officinale* Wiggers (Fam. Compositae). It is native to Western Europe where it grows in meadows, fields and fallow land. Collection is made in the autumn. *Taraxacum* contains a bitter, taraxacin, the monohydric alcohols taraxasterol and homotaraxasterol, fatty acids, sugars and inulin.

Martindale, 26th Edn., p. 330. B.P.C. (1949), p. 892. Merck Index, 7th Edn., p. 1011.

DESCRIPTION

Macroscopical: Cylindrical, tapering, somewhat branched pieces of root, 4-10 cm long and 4-20 mm wide. Often broken into irregular pieces, externally brown and longitudinally wrinkled, with root scars and a somewhat branched crown. The fracture is short and horny, the fractured surface showing alternate layers of brown laticiferous vessels and white parenchyma. A lemon-yellow xylem is also visible. Odour slight; taste sweetish.

Microscopical: The powder is brown-yellow in colour and consists of large white parenchymatous cells, brown reticulate vessels and tracheids and non-lignified fibres with irregular simple pores. Also present are laticiferous vessels, and brown cork fragments. Calcium oxalate is absent.

Greenish, 6th Edn., p. 333. Jackson & Snowdon, p. 146.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 5%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 40%.

Paper Chromatography: Kasprzyk, Z., Fonberg, M., Polus, E., Raczynski, G. and Rafalski, A. (1965), Bull. Acad. Polan. Sci. Ser. Sci. Biol., 13, 77-81.

Thin Layer Chromatography: Kasprzyk, Z., Grzelczak, Z. and Pynek, J. (1965), Bull. Acad. Sci. Ser. Sci. Biol., 13, 661-55.

THERAPEUTICS

Action: Diuretic. Laxative. Cholagogue. Antirheumatic.

Indications: Cholecystitis. Gall-stones. Jaundice. Atonic dyspepsia with constipation. Muscular rheumatism. Oliguria.

Specific Indications: Cholecystitis and dyspepsia.

Combinations used: Used with Veronicastrum, Berberis and/or Chelone in gall-bladder disease. Combines well with Chamaemelum in anorexia and stomach complaints.

Preparations and Dosage: (thrice daily)

Dried root. Dose 2-8 g or by infusion or decoction. Liquid Extract (B.P.C. 1949) 1:1 in 30% alcohol. Dose 2-8 ml. Tincture 1:5 in 45% alcohol. Dose 5-10 ml. Juice of fresh root B.P.C. 1949. Dose 4-8 ml.

TEUCRIUM CHAMAEDRYIS

SYNONYMS

Germander; Wall Germander.

DEFINITION

Teucrium Chamaedreys consists of the dried herb of *Teucrium chamaedrys* L. (Fam. Labiatae), indigenous to Great Britain. It contains a volatile oil, flavonoids, bitter principles and tannins.

DESCRIPTION

Macroscopical: leaves ovate, obtuse, attenuate at base with a short petiole, margin deeply crenate, upper surface dark-green, lower surface pale-green, both surfaces with shiny hairs; stem downy, quadrangular; flowers pinkish-purple with five-toothed calyx, teeth of approximately equal size; fruit of three brown ovoid nutlets held within persistent calyx. Odour faintly aromatic; taste bitter.

Microscopical: Powder brown-green; leaves dorsiventral, upper epidermis with wavy beaded anticlinal walls; uniseriate covering trichomes of up to four cells, few labiate glandular trichomes; lower epidermis with wavy anticlinal walls and striated cuticle, stomata diacytic, covering trichomes as upper epidermis, labiate glandular trichomes numerous, other glandular trichomes with unicellular stalk and bicellular glandular head; epidermal cells from both surfaces contain feathery and cluster crystalline masses. Epidermal cells of calyx with wavy anticlinal walls, parenchyma with pink-purple coloured contents; parenchyma from nutlets containing prism and needle crystalline deposits and crystal sand. Epidermis of stem with straight anticlinal walls, lignified pitted pericyclic fibres, lignified spiral and tracheidal vessels, pith parenchyma lignified and pitted. Pollen with smooth or finely warty exine and three pores and furrows.

Chromatography: Grzybek, J. (1968), Diss. Pharm. Pharmacol., 20, 563.

THERAPEUTICS

Action: Gastric stimulant. Bitter. Diaphoretic. Anti-catarrhal. Antimicrobial. Anti-inflammatory.

Topically: Mild antiseptic. Vulnerary.

Indications: Dyspepsia. Anorexia. Nasal catarrh. Chronic bronchitis. Gout. Rheumatoid arthritis.

Topically: Cutaneous eruptions.

Specific Indications: Acute summer diarrhoea of infants.

Combinations used: May be combined with Apium, Filipendula and Guaiacum in rheumatoid arthritis: with Marrubium and Lobelia in acute and chronic bronchitis.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

TEUCRIUM SCORODONIA

SYNONYMS

Wood Sage: Garlic Sage.

DEFINITION

Teucrium Scorodonia consists of the dried herb of *Teucrium scorodonia* L. (Fam. Labiatae), indigenous to Great Britain. It contains about 0.3% of an essential oil, flavonoids, saponins and about 1.2% tannins.

DESCRIPTION

Macroscopical: Leaves opposite, stalked, ovate to lanceolate with crenate margin, wrinkled, dark-green on upper surface, paler green on lower surface; stem downy, quadrangular. Flowers pale-yellow, in pairs, with 5-toothed calyx, upper tooth broad, four lower teeth small, corolla tube twice as long as calyx. Odour of sage; taste very bitter.

Microscopical: Powder brown-green; leaves dorsiventral: upper epidermis with wavy-anticlinal walls, covering trichomes unicellular or multicellular uniseriate with warty walls, few glandular trichomes of labiate type; lower epidermis with straight or slightly wavy anticlinal walls, stomata diacytic, covering trichomes similar to upper epidermis having mainly three cells, numerous labiate glandular trichomes and glandular trichomes with unicellular stalk and uni- or bi-cellular glandular head; mesophyll cells contain oil and needle crystalline inclusions. Epidermis of stem with straight anticlinal walls, pitted pericyclic fibres slightly lignified, lignified spiral, reticulate and tracheidal vessels, lignified rectangular pitted pith cells. In the powder many glandular trichomes from the flowers with multicellular uniseriate stalk and unicellular glandular head; petal fragments yellow to pink with papillose epidermis; sepals with many multicellular uniseriate warty covering trichomes; pollen smooth or finely warted with three pores and furrows.

Paper Chromatography: Neumann, K. (1965) *Planta Med.*, 13, 331.

THERAPEUTICS

Action: Astringent. Diaphoretic. Antirheumatic. Carminative. Vulnerary. Antimicrobial.

Indications: Upper respiratory infection. Rheumatic conditions. Flatulent dyspepsia.

Topically: Indolent ulcers. Furunculosis.

Specific Indication: Feverish colds.

Combination used: May be combined with *Achillea*, *Mentha Piperita* and *Sambucus* in the common cold; used with *Stellaria* as poultice for abscesses or carbuncles.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

THUJA

SYNONYMS

Arbor-vitae; Tree of Life Tips; American Cedar Leaves.

DEFINITION

Thuja consists of the dried, younger twigs of *Thuja occidentalis* L. (Fam. Cupressaceae). The plant is a native European tree, coniferous pyramidal, with flattened branches, the twigs in one plane bearing small scale-like leaves. Thuja contains a volatile oil, flavonoids, mucilage and an astringent.

DESCRIPTION OF CUT HERB

Macroscopical: Small lengths of flattened, green twigs, bearing paired, decussate leaves about 3 mm long, the keeled alternately lateral pairs partly concealing the flat rhomboidal, facial pairs which are pressed close together. Not more than 2% of the stem over 4 mm diameter. Odour and taste strongly camphoraceous.

Microscopical: Epidermal cells elongated, partly lignified, covered with a crusty cuticle. Stomata anomocytic, lignified and broadly elliptical, large and sunken beneath the subsidiary cells. Trichomes and calcium oxalate absent.

U.S.D., 22nd Edn., p. 1618.

Gas Chromatography: Von Rudloff (1961) Can. J. Chem. 39 1200.

Ash: Not more than 8%.

THERAPEUTICS

Action: Nerve stimulant. Stimulates uterus and heart muscles. Expectorant. Diuretic. Astringent. Counter irritant.

Indications: Bronchial catarrh. Enuresis. Cystitis. Psoriasis. Has been used in uterine carcinomas. Amenorrhoea. Rheumatism.

Topically: Warts, particularly genital and anal. (Sicard *et al.* (1909)).

Specific Indications: Bronchitis with cardiac weakness. Warts, oral and topical use. Reported to be of value as an anti-carcinomatous agent. Counteracts ill effects of smallpox vaccination.

Combinations used: May be combined with Grindelia, Senega, or Lobelia in pulmonary disease.

Lotion: With Hamamelis Water in exudative eczema.

Contra-indications: In pregnancy may cause abortion by reflex uterine contractions.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 1-2 g or by infusion. Liquid Extract 1:1 in 50% alcohol. Dose 2 ml. Tincture 1:10 in 60% alcohol. Dose 1-2 ml.

THYMUS SERPYLLUM

SYNONYMS

Wild Thyme; Mother of Thyme; Serpyllum; Herba Serpylli; Serpolet; Quendel.

DEFINITION

Thymus Serpyllum consists of the dried herb of *Thymus serpyllum* L. (Fam. Labiatae), indigenous to Great Britain and Europe. It yields approximately 0.6% of volatile oil containing p-cymol, carvacrol, thymol (1%), d, l- α -pinene and sesquiterpenes, a bitter (serpyllin), 3-7% tannin and flavones. Martindale 27th Edn., p. 1027.

DESCRIPTION

Macroscopical: Short-stalked leaves lanceolate or ovate oblong, very small, up to 7 mm long and 2 mm broad, some forming spike with 4-6 leaves, margin entire, pubescent; stems downy and slender; flowers with pink-purple corolla, green or purple calyx five-toothed, lower three broad, upper two narrow. Odour, characteristic; taste aromatic.

Microscopical: Powder dark green; leaf dorsiventral; upper epidermis with wavy anticlinal walls, numerous unicellular warty covering trichomes, some warty multicellular, uniseriate labiate glandular trichomes some with red-brown to golden contents; lower epidermis with wavy anticlinal walls and diacytic stomata, trichomes as upper epidermis, with more numerous uniseriate, warty, covering trichomes up to 50 μ m long; trichomes from calyx about 300 μ m long, uniseriate and warty; pollen grooved, up to 40 μ m diameter.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Paper Chromatography: Hoerhammer, L., Richter, G. and Wagner, H. (1963) J. Chromatog., 10, 108.

Thin-Layer and Gas-Liquid Chromatography: Wellendorf, M. (1963) Dansk Tidsskr. Farm., 37, 145.

THERAPEUTICS

Action: Spasmolytic. Carminative. Antimicrobial. Antitussive. Broncholytic. Diuretic. Sedative. Vulnerary. Rubefacient. Antiseptic.

Indications: Bronchitis. Bronchial catarrh. Pertussis. Laryngitis. Flatulent dyspepsia. Colic. Dysmenorrhoea.

Topically: Wounds. Mastitis (herb). Rheumatism. Sciatica (oil).

Specific Indications: Pertussis.

Combinations used: May be given with *Prunus*, *Marrubium*, *Lobelia* and *Tussilago* in whooping cough. Combines with *Myrrh*, *Rubus* and *Echinacea* as a gargle in acute throat infections.

Preparations and Dosage: (thrice daily)

Dried herb: Dose 0.6-4 g or by infusion. Liquid Extract 1:1 in 45% alcohol.

Dose 0.6-4 ml.

THYMUS VULGARIS

SYNONYMS

Common Thyme; Garden Thyme; Thyme; Rubbed Thyme.

DEFINITION

Thymus Vulgaris is the dried leaves and flowering tops of *Thymus vulgaris* L. (Fam. Labiatae), a small evergreen shrub indigenous to Spain and Italy, but cultivated both in Europe and the United States. *Thymus Vulgaris* contains not less than 1% of volatile oil, the principal components of which are thymol and carvacrol, together with a resin, about 10% tannin and gum.

B.P.C. (1949), p. 913. Martindale 27th Edn., p. 1029.

DESCRIPTION

Macroscopical: Stems quadrangular, pubescent, hollow 0.5-1.0 mm in diameter, yellow-green to brown-purple in colour. Leaves ovate-lanceolate or ovate-oblong, up to 6 mm long and 0.5-2 mm wide, upper surface grey-green, pubescent, lower surface paler, sessile or shortly petiolate, margin entire and revolute, apex acute, base tapering. Flowers in axillary clusters or terminal glomerules; calyx 5-toothed and 2-lipped with a ring of stiff hairs in the throat; corolla bilabiate, pale-rose to white in colour, 4 stamens, nutlets ovoid 0.5 mm in diameter, smooth. Odour and taste aromatic.

Microscopical: Grey-green powder; leaf fragments, epidermal cells prolonged into uncellular pointed papillose trichomes, 60 μ m long; trichomes of the lower surface uniseriate, 2-3 celled, sharp pointed, up to 300 μ m long with thick papillose walls, occasionally the terminal cell being curved or hooked. Glandular trichomes, uncellular stalk, spherical uncellular head about 20 μ m in diameter, numerous labiate trichomes with 8-12 secretory cells up to 80 μ m in diameter; broadly elliptical xerophyllaceous stomata. Six to eight celled uniseriate trichomes from the calyx up to 400 μ m long, pollen grains spherical; pericyclic fibres of the stem.

Total Ash: Not more than 12%.

Acid Insoluble Ash: Not more than 4%.

Content of stalks: Not more than 15% of stem having a diameter up to 1 mm. Stem exceeding 1 mm in diameter absent.

Foreign Organic Matter: Not more than 2%.

Thin-Layer Chromatography: Gabel, E., Müller, K. H., Schoknecht, J. (1962) Dtsch. Apoth. Ztg., 102, 293.

THERAPEUTICS

Actions: Carminative, Spasmodic, Antispasmodic, Expectorant, Secretory effect, Bactericidal, Anthelmintic, Astringent.

Indications: Dyspepsia, Colic, gastritis, Bronchitis, Pertussis, Asthma, Laryngitis, Pharyngitis, Emphysema, Tracheitis, Laryngitis, Tracheitis, angaritis.

Specific Indications: Pertussis, Bronchitis.

Combinations used: May be combined with Lobelia and Ephedra in asthma; with Prunus, Urtica and Marrubium in pertussis.

Preparations and Dosage: (Thrice daily)

Dried herb: Dose 1-4 g or by infusion. Liquid Extract B.P.C. (1949) Dose 0.5-4 ml. Juice of Thyme B.P.C. (1949) Dose 4-8 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

TILIA

SYNONYM

Lime Flower.

DEFINITION

Tilia consists of the dried inflorescences of *Tilia platyphyllos* Scop. and *T. cordata* Mill. Fam. Tiliaceae. The plants are native British trees, 25-30 m tall. Flowers small, yellowish-white in clusters.

Tilia contains volatile oil, mucilage, tannin, hesperidin, saponins and sugars.

Marquand, 21st Edn., p. 1420, B.P.C. (1934), p. 1063, B.P.C. 1949, p. 919.

DESCRIPTION OF CUT FLOWERS WITH BRACTS

Macroscopic: Yellow brown dried flower buds. 5 sepals, about 4 mm long, pubescent. Many flat pieces of bract, 0.5 x 1 cm, upper surface glabrous, light green, lower surface pubescent and lighter green. Odour faintly aromatic, taste aromatic and mucilaginous.

Microscopic: Flowers. Epidermal cells of both surfaces of petals are elongated with straight anticlinal walls. Inner epidermal cells show unilaminar cuticle and large mucilaginous cells beneath staining with ruthenium red. Outer epidermal cells have beaded anticlinal walls, cells distinctly papillose. Epidermal cells of the sepal have straight or slightly wavy, anticlinal walls. Anomocytic stomata are found in the outer surface only. Stenate (7-9 cells) covering trichomes, slightly lignified, occur mainly on the outer surface. Long unilocular covering trichomes occur at the base of the inner surface. Glandular trichomes with a unilocular stalk and multicellular head occur mainly at the borders. Both sepal and petal contain numerous calcium oxalate clusters, 3-16 μ m in diameter. Numerous irregular pollen grains with 3 pores and finely warty exine, 46-44 μ m in diameter, present.

Bracts: Epidermal cells polygonal in the upper surface and sinuous in the lower surface with striated cuticle. Anomocytic stomata in the lower epidermis only. Many stellate covering trichomes mainly on the lower surface. Occasional glandular trichomes with unicellular stalk and multicellular head occur over the veins. Occasional calcium oxalate-cluster crystals scattered in the mesophyll and associated with the veins. Deryng., p. 202-3. Flück *et al.* p. 106-7.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

Thin Layer and Gas Liquid Chromatography: Bernasconi & Gebistorf (1968) Pharm. Acta. Helv., 43, 677.

THERAPEUTICS

Action: Sedative. Spasmolytic. Diaphoretic. Diuretic. Mild Astringent.

Indications: Migraine. Hysteria. Arteriosclerotic hypertension. Feverish colds.

Specific Indication: Raised arterial pressure associated with arteriosclerosis and nervous tension.

Combinations used: Combines well with Crataegus in hypertension; with Humulus for the nervous system in neurosis; and with Sambucus in the common cold.

Preparations and Dosage:

Dried inflorescence with bract. Dose 2-4 g by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 1-2 ml.

TOXICODENDRON

SYNONYMS

Poison Oak; Poison Ivy; Poison Vine; *Rhus toxicodendron* L.

DEFINITION

Toxicodendron consists of the leaves and stems of *Toxicodendron radicans* (L.) Kuntze (Fam. Anacardiaceae), a vine-like weed indigenous to the United States of America. Toxicodendron contains a mixture of allergenic, amphiphatic catechols known as 'urushiol', the majority of the mixture being saturated and unsaturated 3-n-pentadecyl and 3-n-heptadecyl – catechols.

B.P.C. (1934), p.493. Martindale 27th Edn., p.1807.

DESCRIPTION

Macroscopical: Leaves compound, 3-foliolate with a long petiole, leaflets obliquely ovate, up to 10 cm long and 5 cm wide, shortly petiolate, apex acute or acuminate, narrowed at the base, margin entire or slightly dentate, dark green on the upper surface, greyish green beneath, both surfaces slightly pubescent, particularly over the veins. Leaves brittle when dry and frequently much broken in the commercial material. Stems woody, up to 10 mm in diameter, pale reddish to purplish brown, finely ridged longitudinally with scattered hairs and numerous conspicuous, raised lenticels and some with the remains of thin, wiry aerial rootlets, occurring in groups. Attached to a number of the stems are fruiting branches bearing clusters of greyish green, subspherical drupes about 5 mm in diameter. Odour faint; taste astringent and slightly acid.

Microscopical: Powder dark green. Epidermal cells of the leaves with sinuous walls and with a striated cuticle on the upper epidermis; anomocytic stomata on lower epidermis only; covering trichomes abundant, some unicellular and needle-like, the majority multicellular, uniseriate and tapering, up to 150 μ m long, with moderately thickened walls; underlying palisade with very large, cuboid or rectangular calcium oxalate crystals and some smaller, cluster crystals also occur in the spongy mesophyll; reddish brown resin canals associated with the vascular tissue. Fragments of cork from the stems composed of polygonal, thin-walled cells with areas of deeply pigmented, rounded cells forming the lenticels; other stem fragments with cluster crystals of calcium oxalate in longitudinal files of parenchymatous cells and abundant, anastomosing resin canals with reddish brown contents. Epicarp of the fruits composed of a layer of small, rectangular cells with irregularly thickened cellulose walls and numerous pits.

Chromatography: Corbett, M. and Billets, S. (1975) *J. Pharm. Sci.*, *64*, 1715.

THERAPEUTICS

Action: In minute doses has been used as dermatological agent, and as prophylactic and treatment in poison ivy dermatitis.

Topically: Dermatological agent.

Combinations used: Does not combine with other remedies.

Preparations and Dosage:

Tincture in 60% alcohol 1:10. Dose 0.06-0.12 ml.

Topically: (Lotion) – Tincture 2.5-5 ml in 100 ml diluent.

Caution: Toxicodendron species produce contact allergenic dermatitis together with cross sensitisation to several related groups of phenolic compounds. Treatment must be discontinued at once should signs of sensitivity reaction appear.

TRIFOLIUM PRATENSE

SYNONYM

Red Clover Flowers.

DEFINITION

Trifolium Pratense consists of the dried flowerheads of *Trifolium pratense* L. (Fam. Papilionaceae). The plant is a native British herb, up to 60 cm tall, with leaves composed of three entire obovate leaflets often with a whitish crescent towards their base, bearing globose heads of purplish flowers. *Trifolium Pratense* contains various phenolic glycosides including trifoliin and flavonoids.

DESCRIPTION OF FLOWERHEADS

Macroscopical: Flattened, lightweight, ovoid flowerheads up to 3 cm in diameter, composed of a number of purple to brown sessile curved papilionaceous flowers up to 1.5 cm long, each with a pubescent calyx around the base about 0.5 cm long terminating in 5 sharply pointed teeth. Few dull green fragments of trifoliate leaves.

Microscopical: Covering trichomes of the calyx and leaves long, unicellular, thick walled, finely but not densely warted, pointed, parallel with each other, directed away from the base, about 500 μm long around the calyx tube, about 750 μm long on the leaflets, and over 1 mm long on the calyx teeth. Leaf epidermis with slightly sinuous beaded anticlinal walls. Stomata anomocytic, in the lower leaf epidermis only. Calcium oxalate prisms forming a sheath around the leaf veins. Pollen, released from 10 anthers, in angularly spherical grains, with a reticulate exine and 3 projecting pores, about 40 μm in diameter.

U.S.D., 22nd Edn., p. 1151.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

THERAPEUTICS

Action: Dermatological agent. Mildly antispasmodic. Expectorant.

Indications: Chronic skin disease. Whooping cough.

Specific Indications: Eczema. Psoriasis.

Combinations used: Combines well with *Rumex Crispus* in chronic skin disease.

Preparations and Dosage: (thrice daily)

Dried inflorescence. 4 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 1.5-3.0 ml. Tincture 1:10 in 45% alcohol. Dose 1-2 ml.

TRIGONELLA

SYNONYM

Fenugreek seeds.

DEFINITION

Trigonella is the dried ripe seeds of *Trigonella foenum-graecum* L. (Fam. Leguminosae), an annual herb indigenous to the Mediterranean area and cultivated in Southern Europe, Northern Africa and India. Trigonella contains about 0.13% of an alkaloid, trigonelline, about 1.5% of sapogenins consisting mainly of diosgenin and yamogenin, mucilage, oil, proteins and aromatic hydrocarbons.

B.P.C. (1949), p.363. Martindale 27th Edn., p.922.

DESCRIPTION

Macroscopical: Seeds rhomboidal, light to dark yellow-brown, nearly smooth, 5-7 mm long and about 2 mm thick; on one side runs a diagonal depression, dividing the radicle and two yellow accumbent cotyledons. Odour characteristic; taste mucilaginous and slightly bitter.

Microscopical: Pale yellow powder. Palisade epidermis, thick-walled polygonal cells with a small lumen from which radiate distinct pits; hypodermis fragments, a single layer of hourglass cells having bar-like thickening on the radial walls; endosperm cells containing mucilage, large, thin-walled; cotyledons, cells thin-walled, round or polygonal often containing fixed oil and aleurone grains.

Jackson and Snowden, p.100.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not less than 30%.

Thin-Layer Chromatography: Hardman, R., and Jeffries, J.M. (1972). *Analyst*. 97: 437.

THERAPEUTICS

Action: Mucilaginous demulcent. Laxative. Nutritive. Expectorant. Orexigenic.

Topically: Emollient. Vulnerary.

Indications: Dyspepsia. Anorexia. Gastritis. Convalescence.

Topically: Furunculosis. Myalgia. Lymphadenitis. Gout. Wounds. Crural ulcer.

Specific Indication: General debility and anorexia of convalescence.

Combinations Used: May be combined with Lobelia, Ulmus and Echinacea as a poultice in furunculosis, lymphadenitis and suppurating wounds.

TRILLIUM

SYNONYMS

Beth Root; Birth Root; Wake Robin.

DEFINITION

Trillium consists of the dried rhizome and roots of *Trillium erectum* L. and other species (Fam. Liliaceae). The plant is a low perennial herb, native to eastern North America, with a stout simple stem bearing a whorl of 3 ovate leaves, subtending the large terminal flower, dark purple, but frequently white, pinkish or greenish.

Trillium contains a saponin trillarin; fixed oil and tannins.

DESCRIPTION OF CUT RHIZOME AND ROOTS

Macroscopical: Irregular, gravel-like pieces of split rhizome, pale brown with dark brown outer surface on some pieces. Pieces sharply cornered from 0.2 to 1.0 cm in diameter. Pieces of thin, fibrous, light brown root present, up to 2 cm in length. Odour strong and distinct; taste bitter and acrid.

Microscopical: Powder pale yellow. Abundant simple spherical starch grains up to 20 μ m in diameter, a few irregular grains larger. Calcium oxalate needles about 200 μ m long, scattered amongst thin walled parenchyma fragments or in idioblasts. Xylem vessels in groups, with annular or reticulate lignified thickening; fibres absent. Fragments of cork with elongated regular cells with brown contents.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

THERAPEUTICS

Action: Antihaemorrhagic. Astringent. Mild expectorant.

Indications: Metrorrhagia. Menorrhagia. Haematuria. Haemoptysis. Leucorrhoea (decoction used in vaginal douche). Indolent ulcers (used as poultice or ointment).

Specific Indications: Menopausal menorrhagia, associated with depression.

Combinations used: May be combined with Vinca Major and/or Geranium in excessive menstruation: with Bidens in haematuria. As a poultice for ulcers the finely powdered root is mixed with Ulmus and a small quantity of powdered Lobelia seed.

Preparations and Dosage: (thrice daily)

Dried root and rhizome. Dose 0.5-2 g or as decoction in water or milk. Liquid Extract 1:1 in 25% alcohol. Dose 0.5-2 ml. Tincture 1:5 in 40% alcohol. Dose 1-4 ml.

TSUGA

SYNONYMS

Hemlock Spruce; Hemlock Bark; *Pinus canadensis* L. *Abies canadensis* Michx., *Pinus* bark.

DEFINITION

Tsuga consists of the bark of *Tsuga canadensis* Carr. (Fam. Pinaceae), a tree indigenous to North America. It contains tannins (10-14%), a volatile oil and resin.

B.P.C. (1934), p.809.

DESCRIPTION

Macroscopical: Pieces of very variable size, ranging from 3.0 cm long × 2.0 cm wide × 3.0 mm thick to 13.0 cm × 5.0 cm × 2.0 cm. Thinner pieces may be folded. Outer surface of older bark with rhytidome, deeply fissured; exfoliating cork layer on younger bark, reddish coloured; inner surface longitudinally striated, light yellowish brown. Fracture short, fibrous. Odour faintly terebinthinate; taste astringent.

Microscopical: Powder reddish-brown. Cork cells abundant, isodiametric with reddish-brown contents. Fragments of phloem tissue showing medullary rays in transverse section, phloem parenchyma with beaded walls, droplets of volatile oil. Fibres lignified, simple pitted; stone cells frequent, thick-walled, often branched; some lignified simple-pitted parenchyma. Starch and calcium oxalate absent.

THERAPEUTICS

Action: Astringent. Diaphoretic. Diuretic. Antimicrobial.

Indications: Diarrhoea – administered by mouth or as enema. Cystitis. Mucous colitis. Leucorrhoea. Prolapsus uteri (douche). Pharyngitis. Stomatitis. Gingivitis (gargle or mouthwash).

Specific Indications: Diarrhoea. Leucorrhoea.

Combinations Used: Combines with Quercus and Catechu Black in diarrhoea: with Trillium and Hamamelis as douche in leucorrhoea: with Commiphora and Cephælis as a paint in gingivitis.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 1-2 g or as infusion or decoction.

Topically: 1 in 10 as decoction.

Liquid Extract B.P.C. (1934). Dose 1-2 ml.

TURNERA

SYNONYM

Damiana aphrodisiaca.

DEFINITION

Turnera consists of the dried leaves and stem of *Turnera diffusa* Willd. var. *aphrodisiaca* Urb. (Fam. Turneraceae), and also other species of Turnera indigenous to Texas and Mexico. The leaves contain 0.5 to 1% of a green volatile oil, 5 to 7% of a bitter substance damianin, 3-4% of a mixture of resins, tannins, starch, gum and fixed oils.

Martindale, 25th Edn., p. 1518. B.P.C. (1934), p. 383. Merck Index, 7th Edn., p. 318.

DESCRIPTION

Macroscopical: Fragments of pale green or yellow-green leaves 10-15 mm in length and 5 mm wide, serrate margin and a short petiole. Numerous pieces of red-brown stem, 0.5 to 2.0 cm long, 1 mm in diameter. Occasional small yellow pentamerous flowers and small spherical fruits containing yellow crescent shaped seeds. Odour and taste aromatic.

Microscopical: Leaf fragments have straight or slightly wavy-walled epidermal cells and occasional paracytic stomata. Covering trichomes are numerous, long and often sinuous, walls thick, slightly warty, lumen present only at the base. Also present are large clusters of calcium oxalate, a few stone cells, long narrow lumen fibres, small vessels, fragments of lignified parenchyma and red/brown cork cells from the stems. Occasional starch grains are present also spherical pollen grains with a finely pitted exine and three furrows.

Jackson & Snowdon, p. 46.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 3%.

THERAPEUTICS

Action: Antidepressant. Thymoleptic. Mild purgative. Reputed to be aphrodisiac. Stomachic.

Indications: Depression. Nervous dyspepsia. Atonic constipation. Coital inadequacy.

Specific Indications: Anxiety neurosis with a predominant sexual factor.

Combinations used: Combines well, according to the indications, with Avena, Cola, Scutellaria and/or Humulus in nerve diseases.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 2-4 g or by infusion. Liquid Extract (B.P.C. 1934) 1:1 in 60% alcohol. Dose 2-4 ml.

TUSSILAGO

SYNONYMS

Coltsfoot; Farfara.

DEFINITION

Tussilago consists of the dried leaves of *Tussilago farfara* L. (Fam. Compositae). The plant is a common herb, indigenous to temperate Europe and Asia, having large broad heart-shaped, subovate leaves with felted hairs on the under surfaces. The leaves appear after the yellow flowers which are borne on scaly purplish stems.

Tussilago contains mucilage, tannin and a bitter glycoside.

Martindale, 25th Edn., p. 1089, B.P.C. (1949), p. 935.

DESCRIPTION OF LEAVES

Macroscopical: Folded, broken, matted pieces of leaves; upper surface greyish-green and wrinkled; under surface white and tomentose with loosely felted trichomes, prominent brown veins; dentate margin with reddish-brown teeth; base cordate and petiolate; upper surface glabrous. Odour slight; taste mucilaginous, slightly bitter and astringent.

Microscopical: Upper epidermal cells polygonal, papillose and finely striated; lower epidermal cells sinuous and finely striated; stomata mainly confined to the lower epidermis, anisocytic; trichomes mainly confined to the lower epidermis, covering trichomes abundant, forming a thick interlocking mat over the lower epidermis, slender, uniseriate, with 3 to 6 short cells and a very long tortuous terminal cell frequently about 800 μm long; occasional glandular trichomes with a unicellular stalk and a unicellular oval head; palisade mesophyll 3 to 4 cells deep and spongy mesophyll with large air spaces; the teeth at the edge of the leaves retain a red colour when cleared with chloral hydrate; calcium oxalate crystals absent; inulin crystals present in the mesophyll cells.

Deryng, p. 136. Flück *et al.*, p. 135.

Total Ash: Not more than 20%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 3%.

Water Soluble Extractive: Not less than 20%.

Thin Layer Chromatography: Hörhammer, L., Wagner, H. and Rag, B. (1963) *Dt. Apothztg.*, 103, 429-31.

Paper Chromatography: (flowers only) Krystyna, O.B. and Lamer, E. (1962) *Acta. Polon. Pharm.* 19, 199-207.

THERAPEUTICS

Action: Expectorant. Antitussive. Demulcent. Anticatatrrhal.

Indications: Bronchitis. Laryngitis. Pertussis. Asthma.

Specific Indications: Chronic spasmodic bronchial cough.

Combinations used: May be combined with Marrubium and Verbascum in irritating cough.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 0.6-2 g by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 0.6-2 ml. Tincture 1:5 in 45% alcohol. Dose 2-8 ml. Syrup, Liquid Extract 1:4 in syrup. Dose 2-8 ml.

ULIGINOSUM

SYNONYM

Marsh Cudweed.

DEFINITION

Uliginosum consists of the dried plant of *Gnaphalium uliginosum* L. (Fam. Compositae) gathered during the flowering period. The plant is a native British herb up to 20 cm tall, much branched near the base, densely woolly, with small, narrow leaves, bearing small heads of compositous flowers, yellow, with a high proportion of corolla-less florets which exhibit style filaments, the flower heads being overtopped by leaves. Uliginosum contains volatile oil.

DESCRIPTION OF CUT HERB

Macroscopical: Leaves small, crumpled, oblong, grey-green due to the dense covering of silky hairs, up to 5 cm long and 4 mm wide. Flower heads about 1 mm in diameter surrounded by a spreading ring of lanceolate involucre bracts, shiny brown and green on the inner surface, hairy on the outer surface. Florets, many loose, some remaining on the flower heads, about 2 mm long, either yellow and tubular or filamentous. Stem pieces narrow, often branching, obscured by dense, white, silky hairs, forming felted masses with leaves and flower heads. Odour faintly fragrant.

Microscopical: Covering trichomes of the leaf, bracts and stem, very long, numerous, tangled, very fine, about 5 μm in diameter, uniseriate, with a very long terminal cell on a base of 1 or 2 short, cylindrical cells. Leaf epidermis with very sinuous anticlinal walls. Stomata anomocytic. Glandular trichomes of the florets, short, multiseriate, of about 12 cells without any head, about 45 to 65 μm long, on the corolla lip and style apex. Filamentous florets with styles terminating in bifid stigmas, about 1.5 mm long. Pappus hairs, many loose, some surrounding the florets, as long as the styles, multiseriate, of about 4 rows of cells, about 15 μm wide, with the marginal cells overlapping outwards. Pollen grains compositous, spherical, with a spiny exine and 3 pores, 15 to 20 μm in diameter. Calcium oxalate prisms, small, in the ovary walls.

Total Ash: Not more than 20%.

THERAPEUTICS

Action: Anti-catarrhal. Antiseptic. Antitussive.

Indications: Laryngitis. Upper respiratory catarrh. Used as a gargle in tonsillitis and quinsy.

Specific Indications: Catarrhal pharyngitis.

Combinations used: May be given with *Mentha Piperita*.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 1-4 ml.

ULMUS

SYNONYM

Slippery Elm Bark.

DEFINITION

Ulmus consists of the dried inner bark of *Ulmus fulva* Michaux (Fam. Ulmaceae), a tree indigenous to the Eastern and Central United States and Canada. The bark is collected in Spring, the periderm removed, and dried. *Ulmus* contains mucilage, starch and tannin.

B.P.C. (1949), p. 935. Martindale 27th Edn., p. 929.

DESCRIPTION

Macroscopical: Flat oblong pieces up to 30 cm long, but often 10-15 cm long and from 5-10 cm wide; outer surface light brown to red-brown, longitudinally wrinkled and furrowed, with occasional pieces of dark brown periderm. Inner surface yellow or white to yellow-brown, finely striated longitudinally and often cracked transversely. Fracture fibrous, surface light brown and porous. Odour slight and distinct; taste mucilaginous.

Microscopical: Light brown powder, abundant slightly lignified fibres, long or sometimes broken, occur in groups, twisted and irregular in outline with an uneven lumen and blunt ends. Calcium oxalate monoclinic prisms 10-35 μm in width scattered in irregular files in the parenchyma. Mucilage in large masses, mucilage cells or fragments associated with parenchyma or sieve tubes of the phloem. Mucilage stains with ruthenium-red solution exhibiting distinct concentric lamellations. Spheroidal or polygonal starch grains 3-10 μm in diameter with a punctate hilum and faint striations. Occasional cork cells.

Jackson & Snowdon, p. 30.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 1%.

THERAPEUTICS

Action: Demulcent. Emollient. Nutrient. Antitussive.

Indications: Inflammation or ulceration of stomach or duodenum. Convalescence. Colitis. Diarrhoea.

Locally: boils, abscesses and ulcers, as poultice.

Specific Indications: Gastric or duodenal ulceration.

Locally: as poultice in boils and abscesses.

Combinations used: Combines well with *Althaea* in digestive disturbance. Used with *Linum* as poultice.

Preparations and Dosage: (thrice daily)

Powdered bark 1:8 as decoction. Dose 4-16 ml. Coarse powdered Bark with boiling water as poultice. As ingredient in nutritious gruel, 4 g in 500 ml boiling water. Liquid Extract 1:1 in 60% alcohol. Dose 5 ml.

URGINEA

SYNONYMS

White Squill; Scilla; Squill.

DEFINITION

Urginea is the dried sliced bulb of *Urginea maritima* (L.) Baker (Fam. Liliaceae). The plant is indigenous to the Mediterranean region and is collected soon after flowering. *Urginea* contains cardiac glycosides of the bufadienolide type, scillarin A and B. The former is a pure crystalline glycoside, on hydrolysis producing scillaridin A together with the sugar scillabiose. Scillarin B is a mixture of glycosides. *Urginea* also contains mucilage 4-11%, sinistrin and calcium oxalate.

B.P.C. (1973), p. 468. Martindale, 26th Edn., pp. 716-718.

DESCRIPTION

Macroscopical: Transverse slices 5-10 mm thick, curved or straight triangular pieces, 1.0-8.0 cm long. 0.5-1 cm wide at mid-point tapering to either end. Yellow-white, horny in texture, somewhat translucent and breaking with a glassy fracture when dry. Pieces will readily absorb atmospheric moisture. Transverse surface shows a single row of prominent vascular bundles near the concave edge and numerous small bundles scattered through the mesophyll. Odourless; taste mucilaginous and bitter.

Microscopical: Cream-white powder consisting mainly of mesophyll, thin-walled parenchyma cells occasionally associated with starch grains. Many cells contain mucilage in which bundles of acicular raphides of calcium oxalate up to 1 mm long and 10-15 μm wide are embedded. Outer cells contain sinistrin. Epidermal cells polygonal, once or twice as long as they are broad with thick stratified outer wall, stomata rare, anomocytic and circular in outline about 60 μm in diameter. Vascular bundles collateral, scattered in mesophyll, xylem vessels with spiral or annular thickening. Trichomes absent.

Acid Insoluble Ash: Not more than 1.5%.

Thin Layer Chromatography: Zelnik, R. and Ziti, L.M. (1962), J. Chromatog. 9, 371. Zelnik, R. and Guimares (1964), Ibid., 15, 9.

THERAPEUTICS

Action: Expectorant. Cathartic. Emetic. Cardioactive. Diuretic.

Indications: Chronic bronchitis. Asthma with bronchitis. Whooping cough.

Specific Indications: Chronic bronchitis with scanty sputum.

Combinations used: May be combined with Marrubium and Tussilago in bronchitis: with Ipecacuanha in whooping cough.

Preparations and Dosage: (thrice daily)

Dry bulb. Dose 60-200 mg or by infusion. Liquid Extract (B.P.C. 1973) 1:1 in 70% alcohol. Dose 0.03-0.2 ml. Tincture (B.P.C. 1973) 1:10 in 60% alcohol. Dose 0.3-2 ml. Vinegar (B.P.C. 1973) 1:10 in dilute acetic acid. Dose 0.6-2 ml.

URTICA

SYNONYM

Stinging Nettle.

DEFINITION

Urtica consists of the dried aerial parts of *Urtica dioica* L. (Fam. Urticaceae) gathered during the flowering period. The plant is a native British herb, up to 150 cm tall, upright, having stinging hairs, with ovate, usually cordate, toothed leaves, bearing insignificant axillary heads of green flowers.

Urtica contains indolic compounds including histamine and 5-hydroxytryptamine, and various acids, including ascorbic acid.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf pieces wrinkled and rolled, of various shades of dark green, bearing obvious stinging hairs. Stem pieces ridged, hollow, perhaps split, hairy, pale green-brown. May cause irritation if handled.

Microscopical: Covering trichomes unicellular, up to 700 μm long, slender and conical, often curved. Glandular trichomes, few, over veins, on the lower surface, with short unicellular stalks, and small, rounded heads of 2 to 4 cells. Stinging hairs unicellular, elevated on a multiseriate base, conical, up to 2 mm long, thick-walled, pointed, with an apex which is readily broken away, very birefringent. Leaf epidermis with sinuous anticlinal walls, some cells containing dense, granular, non-birefringent cystoliths of calcium carbonate. Stomata anomocytic. Calcium oxalate clusters, small, scattered, birefringent.

Deryng, p. 164-5.

Total Ash: Not more than 15%.

Acid Insoluble Ash: Not more than 4%.

Paper Chromatography: Collier & Chesher (1956) Brit. J. Pharmac. Chemother. 11 186.

THERAPEUTICS

Action: Anti-haemorrhagic. Reported to have hypoglycaemic properties. Keeser, (1940)Dt. med. Wschr., 849.

Indications: Uterine haemorrhage. Cutaneous eruptions. Infantile and psychogenic eczema. Epistaxis. Melaena.

Specific Indications: Nervous eczema.

Combinations used: Combines well with Lappa Root.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 3-4 ml. Tincture 1:5 in 45% alcohol. Dose 2-6 ml.

VALERIANA

SYNONYMS

Valerian Rhizome; Valerian Root.

DEFINITION

Valeriana consists of the rhizome and roots of *Valeriana officinalis* L. (Fam. Valerianaceae), collected in the autumn and slowly dried. Valerian is cultivated in Britain, Holland and Belgium; it contains 1% of volatile oil, a volatile alkaloid and methyl-2-pyrrolyl ketone.

B.P.C. (1963), p. 876, Martindale, 26th Edn., p. 2046.

DESCRIPTION

Macroscopical: Consists of root and rhizome. Rhizome upright, more or less truncate 2-4 cm long and 1-2 cm in width, dark brown, upper portion having circular stem and leaf scars, side sometimes with a short branch or stolon with numerous roots or root scars. Rhizomes often cut into 3 or 4 pieces. Roots 2-15 cm long, 1-2 mm wide, longitudinally wrinkled and brittle. Odour aromatic and pungent. Taste bitter and camphoraceous.

Microscopical: Powder dark brown, starch grains numerous 3-20 μm in diameter, spheroidal, plano-convex, 2-4 compound, packed into parenchymatous cells. Tracheids with bordered pits, vessels with reticulate thickening, narrow lignified fibres, occasional fragments of epidermis with root hairs and fragments of cork.

Total Ash: Not more than 15%.

Acid Insoluble Ash: Not more than 7%.

Foreign Organic Matter: Not more than 5%.

Paper Chromatography: Thies, P.W. (1966), Tetrahedron Lttrs., 11, 1163.

THERAPEUTICS

Action: Sedative. Mild anodyne. Hypnotic. Spasmolytic. Carminative. Hypotensive.

Indications: Hysterical states. Excitability. Insomnia. Hypochondriasis. Migraine. Cramp. Intestinal colic. Rheumatic pains. Dysmenorrhoea.

Specific Indications: Conditions presenting nervous excitability.

Combinations used: Combines well with *Viscum* and *Scutellaria* in hysteria; with *Humulus* and *Passiflora* in insomnia; with *Viburnum Opulus* in cramps and with *Dioscorea*, *Caulophyllum* and *Pulsatilla* in dysmenorrhoea.

Preparations and Dosage: (thrice daily)

Dried rhizome and root. Dose 0.3-1 g or by infusion or decoction. Liquid Extract (B.P.C. 1963) 1:1 in 60% alcohol. Dose 0.3-1 ml. Tincture Simple (B.P.C. 1949) 1:8 in 60% alcohol. Dose 4-8 ml. Concentrated infusion (B.P.C. 1963) 1:5 in 25% alcohol. Dose 2-4 ml.

VERBASCUM

SYNONYMS

Mullein.

DEFINITION

Verbascum consists of the dried leaves and stems of *Verbascum thapsus* L. (Fam. Scrophulariaceae), an erect biennial herb common on waste ground in Europe and Great Britain, and naturalised in the U.S.A. The leaves are collected in summer and contain mucilage, a trace of volatile oil, resin and a saponin.

Martindale 27th Edn., p. 934.

DESCRIPTION

Macroscopical: Leaves obovate to ovate, 5-50 cm long and up to 15 cm broad, apex acute or subacute, margin crenate, base decurrent, pale grey-green and densely pubescent throughout, much broken in the commercial samples to less than 1 cm. Pieces of stems and petioles broken and flattened, 1-2 cm long and 5 mm to 1 cm wide, dark-brown, longitudinally striated and ridged, covered in woolly hairs. Taste mucilaginous and slightly bitter; odourless.

Microscopical: Grey-green powder; leaf fragments, very wavy-walled epidermal cells, frequent anomocytic stomata, numerous characteristic candelabra covering trichomes with individual cells up to 600 μm in length; glandular trichomes, bicellular stalk and a spherical glandular head; large mucilage cells below the epidermis. Stem fragments, bundles of fibres and lignified vessels.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 4%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Expectorant. Demulcent. Mild diuretic.
Topically: Emollient. Vulnerary.

Indications: Bronchitis. Tracheitis. Influenzal cold with respiratory catarrh.
Topically: Preparation in olive oil for inflamed mucosa.

Specific Indications: Bronchitis with hard cough and soreness.

Combinations used: Combines well with Marrubium, Tussilago and Lobelia in acute or chronic bronchitis.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 4-8 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 4-8 ml.

VERBENA

SYNONYM

Vervain Herb.

DEFINITION

Verbena consists of the dried aerial parts of *Verbena officinalis* L. (Fam. Verbenaceae), a perennial herb with a woody stalk and several stiffly erect stems. Verbena is indigenous to England, Europe, North Africa and Asia and has been introduced into North America. It contains the glycoside verbenalin, a bitter principle and tannin.

DESCRIPTION

Macroscopical: Consisting of fragments of stem, leaf, flowers and nutlets. Stem pieces 0.5 to 2 cm long, 3-5 mm thick, rectangular, externally reddish brown or green, longitudinally striated, internally pale cream with a thin brown bark and wide pith. Leaf fragments 3-5 mm long, 2-4 mm wide, margin serrate, upper surface brown-green, glabrous, lower surface green-grey with a prominent midrib. Flower buds frequent in slender terminal spikes 1-2 mm long, 1 mm wide, enclosed in green ovate-acuminate bracts. Nutlets occur in groups of four, separating when older, 2 mm long, 1 mm wide, reddish-brown, truncate, granulate on inner surface. Odour slight. Taste bitter.

Microscopical: Brown-green powder. Stem fragments large oval pith cells, bundles of narrow annular lignified vessels associated with narrow fibres, patches of brown regular cork cells covering a thick epidermis of rectangular cells and frequent stomata. Leaf fragments epidermis with slightly wavy walls, straight walled and elongated over the veins; upper surface frequent anomocytic stomata, unicellular covering trichomes, pointed at the apex with a wide base. Corolla epidermis similar to leaf, covered in a dense mat of long trichomes; oval pollen grains 2-5 μm in diameter, one germinal pore and a finely pitted exine. Bracts with similar epidermis to leaf, trichomes more frequent, endodermis of elongated cells with wavy walls. Fibres of bracts and corolla long, narrow, covered with cells containing prisms of calcium oxalate. Some seed structures present, seed coat epidermis with occasional covering hairs, dense layer of lignified oval sclereids five to six cells thick, parenchyma packed with particles of protein.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

Thin Layer Chromatography: Groger, D. and Simchen, P. (1967), *Pharmazie*, 22, 315.

THERAPEUTICS

Action: Sedative. Thymoleptic. Spasmolytic. Mild diaphoretic. Reputed galactagogue.

Indications: Depression. Melancholia. Hysteria. Generalised seizures. Cholecystalgia. Jaundice. Early stages of fevers.

Specific Indications: Depression and debility of convalescence after fevers, especially influenza.

Combinations used: May be combined with *Scutellaria*, *Cypripedium* and *Avena* in depressive states.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:1 in 40% alcohol. Dose 5-10 ml.

Note: reported galactagogue action 'Die Gift und Arzneipflanzen', Gessner, O. (1953), 315.

VERONICASTRUM

SYNONYMS

Black Root; Culver's Root; *Leptandra virginica* (L.) Nutt; *Veronica virginica* Tourn.

DEFINITION

Veronicastrum consists of the dried rhizome and roots of *Veronicastrum virginicum* (L.) Farwell (Fam. Scrophulariaceae). The plant is a tall perennial herb native to Eastern and Central North America. It contains an amorphous bitter substance, cinnamic and p-methoxycinnamic acid esters, 3,4-dimethoxycinnamic acid, mannitol, dextrose, verosterol, resin, and a mixture of fatty acids.

B.P.C. (1934), p. 589. Merck Index 9th Edn., 5297.

DESCRIPTION

Macroscopical: Pieces of rhizome up to 1 cm in diameter mostly broken up but showing an outer dark greyish-brown surface bearing remains of aerial stems and of roots; fracture short showing a narrow dark-brown cortex, a paler ring of wood and an inner large grey-brown pith. Pieces of root up to 0.5 cm in diameter and 2 cm in length, outer surface dark-brown and smooth or with faint longitudinal striations, sometimes curved and twisted; fracture short showing a thick dark-brown cortex and a narrow paler core of wood. Odour slight; taste bitter and acrid.

Microscopical: Powder dark brown; numerous starch grains, simple or compound with 2-5 components, individual grains 2-20 μ m in diameter; groups of lignified vessels up to 60 μ m in diameter with bordered pits and reticulate thickening; sclereids in groups, elongated, with heavily pitted walls, and forming a continuous layer in the cortex of the rhizome; patches of thick-walled pitted parenchyma cells filled with starch or red-brown and yellow-brown contents; epidermal layer of the root with a thick dark-brown cuticle; patches of slightly lignified cork from the rhizome also present.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 6%.

Foreign Organic Matter: Not more than 5%.

THERAPEUTICS

Action: Mild cathartic. Cholagogue. Diaphoretic. Spasmolytic.

Indications: Chronic constipation associated with hepatic dysfunction. Cholecystitis. Icterus.

Specific Indications: Constipation with symptoms of hepatic congestion.

Combinations used: Combines with Taraxacum, Berberis and Capsicum as a cathartic and hepatic agent; with Hydrastis and Acorus in constipation associated with flatulent distension.

Preparations and Dosage: (thrice daily)

Dried rhizome and root. Dose 0.5-4 g or by decoction. Liquid Extract 1:1 in 70% alcohol. Dose 0.5-4 ml. Tincture 1:5 in 70% alcohol. Dose 2.5-10 ml.

VIBURNUM OPULUS

SYNONYMS

Cramp Bark; Guelder Rose.

DEFINITION

Viburnum Opulus is the dried bark of *Viburnum opulus* L. var. Americanum. (Miller) Aiton. (Fam. Caprifoliaceae), a shrub with nearly erect branches, indigenous to North United States and Canada. Viburnum Opulus contains a resin, viburnin, valeric acid and tannin. Martindale, 25th Edn., p. 1555.

DESCRIPTION OF BARK

Macroscopical: Occurs as strips, chips or occasionally as quills; bark up to 3 mm in thickness, outer surface green-brown and longitudinally wrinkled; few brown lenticels, thicker pieces light grey to brown, finely fissured or scaly; inner surface green-yellow to rusty brown; fracture short; fractured surface, brown outer bark, greenish phelloderm and yellow inner bark. Odour slight; taste astringent and bitter.

Microscopical: Light grey-brown powder; calcium oxalate rosettes 20-40 μ m in diameter and starch grains, 2-10 μ m in diameter, in parenchyma and cells of the medullary rays, occasional yellow-brown resin masses in parenchyma cells; bast fibres with thick undulate walls slightly lignified, end somewhat obtuse. Cork fragments of rectangular cells with thick lignified walls.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Thin Layer Chromatography: Hoerhammer, L., Wagner, H. and Reinshardt, H. (1965), Deut-Apotheker – Ztg., 105 (40), 1371-8.

THERAPEUTICS

Action: Spasmolytic. Sedative. Astringent.

Indications: Spasmodic muscular cramp. Uterine dysfunction. Menopausal metrorrhagia. Threatened miscarriage. Partus praeparator. Infantile enuresis.

Specific Indications: Cramp. Ovarian and Uterine pains.

Combinations used: Combines well with Dioscorea and Zanthoxylum in cramp; with Viburnum Prunifolium and Chamaelirium in threatened miscarriage or uterine pains.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 2-4 g or by decoction. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Tincture 1:5 in 45% alcohol. Dose 5-10 ml.

VIBURNUM PRUNIFOLIUM

SYNONYMS

Black Haw Bark; Sweet Viburnum.

DEFINITION

Viburnum Prunifolium consists of the dried bark of the root or stem of *Viburnum prunifolium* L. (Fam. Caprifoliaceae). The plant is a shrub or small tree common in central and southern Northern America, specifically characterised by its short pointed winter buds, its acuminate, sharply serrulate, ovate leaves on long slender, glabrous, narrow margined petioles. Its sessile white-flowered cymes are succeeded by bluish-black drupes.

Viburnum Prunifolium contains viburnin (a bitter glycoside); tannin; resin and valeric acid.

Martindale, 25th Edn., p. 1554. B.P.C. (1949) p. 944. B.P. (1914) p. 452.

DESCRIPTION OF CUT BARK

Macroscopical: Irregular pieces of bark, up to 1 cm by 1 cm in area and 0.2 cm in thickness with the majority as smaller pieces. Outer surface of bark grey-brown and scaly; inner surface light red-brown with longitudinal striations; occasional pieces with xylem attached. Fracture short and granular showing narrow brown cork and a whitish cortex and phloem in which are embedded conspicuous, scattered, comparatively large, yellowish groups of sclereids. Odour slight of valeric acid; taste bitter and astringent.

Microscopical: Powder red-brown. Starch grains not abundant, single and 2-3 compound up to 12 μ m in diameter. Abundant sclereids, some single but mainly in ovoid masses with small lumens and thick walls with numerous branching pits opening into the lumen. Phloem fibres absent, but occasional groups of lignified fibres present from xylem tissue. Numerous lignified, regularly shaped polygonal cork cells with brown contents. Thin walled parenchyma cells containing oil globules. Brown amorphous masses present. Calcium oxalate clusters isolated or in parenchyma.

Flück, *et al.*, p. 51.

Acid Insoluble Ash: Not more than 3%.

THERAPEUTICS

Action: Uterine sedative. Spasmolytic. Antasthmatic. Hypotensive. Astringent.

Indications: Dysmenorrhoea. False labour pains. Threatened miscarriage. Asthma.

Specific Indications: Threatened abortion, especially with rise in arterial tension.

Combinations used: Combines well with Hydrastis and Chamaelirium in threatened miscarriage.

Preparations and Dosage: (thrice daily)

Powdered bark. Dose 2.5-5 g by infusion or decoction. Liquid Extract 1:1 in 70% alcohol. (B.P.C. 1949). Dose 4-8 ml. Tincture 1:5 in 70% alcohol. Dose 5-10 ml.

VINCA MAJOR

SYNONYM

Greater Periwinkle.

DEFINITION

Vinca Major consists of the dried aerial parts of *Vinca major* L. (Fam. Apocynaceae). The plant is a semi-procumbent shrub with trailing or somewhat ascending stems 30-100 cm long. Leaves dark green, broadly lanceolate. Solitary violet flowers, 4-5 cm in diameter towards the top of short erect stems.

Vinca major contains alkaloids and tannins.

Martindale, 25th Edn., p. 836.

DESCRIPTION OF CUT HERB

Macroscopical: Small flat pieces of glabrous leaf, upper surface olive green, lower surface light green. Thin pieces of hollow, faintly striated, mainly green stem. Intensely bitter taste.

Microscopical: Leaf epidermis with sinuous anticlinal walls. Stomata paracytic, on the lower surface only. Unicellular, smooth, pointed covering trichomes over the larger veins on the upper surface. Calcium oxalate absent.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 3%.

Thin Layer Chromatography: Karl & Trozarek (1966) Lloydia, 29, 26.

THERAPEUTICS

Action: Astringent. Antihaemorrhagic.

Indications: Menorrhagia. Leucorrhoea. Enuresis. Topically – as application to haemorrhoids.

Specific Indication: Menorrhagia.

Combinations used: Combines with Trillium in metrorrhagia and menorrhagia.

Contra-indications: Avoid in constipation.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

VIOLA ODORATA

SYNONYM

Sweet Violet.

DEFINITION

Viola Odorata consists of the dried leaves and flowers of *Viola odorata* L. (Fam. Violaceae). The plant is a native British herb with an oblique rhizome producing long filiform runners. The leaves are dark green 15-60 mm cordate-ovate, obtuse. Flowers are sweet smelling, blue, with a short spur. Viola Odorata contains a glycoside, violarutin; methyl salicylate and saponins.

DESCRIPTION OF CUT HERB

Macroscopical: Curled or rolled light green leaf fragments. Occasional flowers with yellow curled petals. Pieces of pod containing yellow seeds. Many stem pieces, ribbed, hollow, thin-walled, collapsed, light green to yellow. Taste mucilaginous.

Microscopical: Covering trichomes thick-walled and heavily warted, unicellular. Leaf epidermal cells with sinuous anticlinal walls. Stomata anisocytic mainly in lower epidermis. Calcium oxalate rosettes (40 μ m) in a crystal layer in the mesophyll with scattered microrosettes. Petals have a striated cuticle and regular polygonal epidermal cells which are papillose, occasionally extended to form smooth walled unicellular covering trichomes. Calcium oxalate rosettes occur (40 μ m) mainly at the base of the petals and microrosettes are found uniformly scattered.

Total Ash: Not more than 14%.

Acid Insoluble Ash: Not more than 3%.

Foreign Organic Matter: Not more than 2%.

Water Soluble Extractive: Not more than 20%.

Paper Chromatography: Dellinger (1960) An. Bromat., 12, 9.

THERAPEUTICS

Action: Expectorant. Antineoplastic.

Indications: Malignant disease — administered orally or applied locally. Bronchitis. Chronic naso-pharyngeal catarrh.

Specific Indications: Neoplasm in breast or alimentary canal. After tumour extirpation to protect from metastases.

Combinations used: Combines well with Galium.

Preparations and Dosage:

Dried herb. Dose 2-4 g as infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml. Liquid Extract (fresh leaves) 2:1 in 45% alcohol. Dose 2-4 ml.

Note: The administration and application of *Viola Odorata* in malignant disease is reported over a long period, see Fournier (1948) iii, 540; Le Pharmacia Chez Soi (1915), 707; B.P.C. (1923).

The related species, *V. striata* has shown anti-tumour effect in murine tests. Farnsworth, (1968) Lloydia, 246-7.

VIOLA TRICOLOR

SYNONYMS

Heartsease; Wild Pansy; Blue Violet.

DEFINITION

Viola Tricolor is the dried aerial part of *Viola tricolor* L. (Fam. Violaceae), an annual or perennial herb growing up to 40 cm in height and common to Britain and Western Europe. *Viola Tricolor* is collected between May and August and contains an alkaloid, saponins, flavonoids and salicylates.

DESCRIPTION

Macroscopical: Stems yellow-green, hollow, flattened and longitudinally striated, 1-4 cm long, up to 5 mm wide. Leaf fragments light to dark green, 1-3 cm long. Lamina lanceolate, margin crenate to dentate, 1-2 cm wide at the widest point; stipules variable, often palmately lobed; petioles green 1-2 mm wide, up to 3 cm long. Flowers on axillary pedicels 1-2 cm long, five lanceolate sepals, parted at the base beyond the point of attachment; corolla yellow or purple; five stamens and a single style, numerous yellow-brown detached carpels; shiny ovate seeds 1-2 mm in diameter. Odour slight; taste faintly bitter.

Microscopical: A pale green powder. Leaf fragments, very wavy-walled epidermal cells, frequent anomocytic stomata on both surfaces, unicellular covering trichomes short, stout with a wavy cuticle; glandular trichomes, multicellular heads, short multiseriate stalk in the indentations of the margins. Large cluster crystals of calcium oxalate. Corolla fragments, wavy-walled epidermal cells, unicellular covering trichomes, long thick-walled smooth cuticle base of the corolla exhibits numerous characteristic 'buckel haares'. Distinctive pollen square or oval, 3-5 pores, 60-80 μ m in diameter. Stem fragments, elongated epidermal cells, rectangular elongated collenchyma cells, narrow annular thickened vessels and bundles of narrow fibres.

Total Ash: Not more than 15%.

Acid Insoluble Ash: Not more than 4%.

THERAPEUTICS

Action: Expectorant. Diuretic. Antirheumatic. Anti-inflammatory. Laxative.

Indications: Pertussis. Acute Bronchitis. Cystitis, polyuria and dysuria. Capillary fragility. Cutaneous affections.

Specific Indications: Eczema and skin eruptions with serous exudate, particularly when associated with rheumatic symptoms.

Combinations used: May be combined with Tussilago and/or Urtica in whooping cough. Used in conjunction with Rumex Crispus, Galium, Trifolium and Urtica in eczema. Combines with Agropyron, Eupatorium Purpureum and Agathosma in cystitis.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 2-4 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 2-4 ml.

VIRGAUREA

SYNONYM

Goldenrod.

DEFINITION

Virgaurea consists of the dried aerial parts of *Solidago virgaurea* L. (Fam. Compositae) gathered during the flowering period. The plant is a native British herb up to 75 cm tall, upright, with oblong-lanceolate, sessile, finely toothed stem leaves, bearing a head of compositous flowers each with a yellow disc and 6-12 yellow ray florets.

Virgaurea contains saponins, flavonoids and an astringent principle.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments flat, folded, having a fine vein network, grey-green-brown. Separate yellow florets, about 4 mm long if disc, about 7 mm long if ray florets, each having a calyx represented by a feathery, white pappus. Many loose pappus hairs. Flower heads fan-shaped, surrounded by closely overlapping involucre bracts which have a glistening inner surface. Stem pieces thick, perhaps split, pithy, longitudinally striated, shining red-violet on the outside. Taste astringent.

Microscopical: Covering trichomes of the leaf, very long, uniseriate, of 3 to 10 cells, thick-walled, perhaps partly collapsed, some striated along their length. Glandular trichomes of the leaf few, short, uniseriate, with a 1 or 2 celled stalk and a somewhat elongated head. Leaf epidermis with slightly sinuous anticlinal walls, beaded on the upper surface, the cuticle having fine striations crossing the anticlinal walls. Stomata anomocytic. Ray florets terminating in three lobes. Pappus hairs very long, multiseriate, of about four rows of cells, about 30 μm wide, with the marginal cells overlapping outwards. Covering trichomes of the florets, around the ovary, multicellular, biseriate, with a double apex, about 300 μm long. Pollen grains compositous, spherical, with a spiny exine and 3 pores, 20 to 25 μm in diameter. Calcium oxalate absent from leaf.

Deryng, p. 274-5.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Diaphoretic. Antiseptic. Carminative. Diuretic.

Indications: Chronic naso-pharyngeal catarrh. Influenza. Flatulent dyspepsia. Cystitis. Topically – as spray or gargle in nose and throat infection.

Specific Indications: Low grade inflammation of the naso-pharynx with persistent catarrh.

Combinations used: Used with Uliginosum in nasopharyngeal catarrh.

Preparations and Dosage: (thrice daily)

Dried herb. Dose 0.5-2 g or by infusion. Liquid Extract 1:1 in 25% alcohol.

Dose 0.5-2 ml. Tincture 1:5 in 45% alcohol. Dose 0.5-1 ml.

VISCUM

SYNONYM

Mistletoe.

DEFINITION

Viscum consists of the dried young leafy twigs of *Viscum album* L. (Fam. Loranthaceae) collected in spring. The plant is a native British shrub, hemiparasitic on the branches of deciduous trees, especially apple or black poplar on the Continent, with repeatedly forked stems and opposite pairs of oblanceolate, evergreen leaves, bearing small heads of unisexual green flowers in spring.

Viscum contains viscotoxin, a cardioactive polypeptide-carbohydrate, oleanolic acid, a triterpenoid sapogenin, choline and histamine.

Martindale, 25th Edn., p. 1249 B.P.C. (1934), p. 1114.

DESCRIPTION OF CUT HERB

Macroscopical: Leaf fragments thick, flat, reticulately shrivelled on the surface, yellow-green, with entire margins. Stem pieces deeply grooved longitudinally, with a wide, light yellow-green bark surrounding white wood. Flowers crumpled spheres of sepaloid petals, up to 5mm in diameter, pale green. Odour distinctive.

Microscopical: Leaf epidermis with polygonal anticlinal walls, thickened and finely beaded. Stomata paracytic, large, about 55 μ m long. Calcium oxalate in mesophyll, many isolated clusters about 35 μ m in diameter. Trichomes absent. Pollen grains spherical, with a finely spiny exine and 3 pores, about 45 μ m in diameter.

Deryng, p. 276-7.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 15%.

Paper Electrophoresis: (viscotoxin); Winterfield & Henken (1960) Arch. Pharm., Berl., 293 820.

Paper Chromatography: (oleanolic acid): Pasich (1950) Diss. Pharm. Pharmac. 11 23.

THERAPEUTICS

Action: Hypotensive. Cardiac depressant. Sedative. Reputed to be of use as anti-neoplastic.

Indications: High blood pressure. Arteriosclerosis. Nervous tachycardia. Hypertensive headache. Chorea. Hysteria.

Specific Indications: Arterial hypertension.

Combinations used: May be combined with Crataegus and/or Tilia in benign hypertension.

Preparations and Dosage: (thrice daily)

Dried leaves. Dose 2-6 g or by infusion. Liquid Extract 1:1 in 25% alcohol. Dose 1-3 ml. Tincture 1:5 in 45% alcohol. Dose 0.5 ml. Infusion 1:20 in cold water.

Note: Reputed to be of use as an antineoplastic N.R. Farnsworth, (1966) J. Pharm. Sci., 3 234; Selawry O.S. (1961) *et al.* Z. Physiol. Chem 324 262; Samuelson, G., (1962) Svensk. Farm. Tidschr. 66 261; Winterfield, K., (1963) *et al.*, Arzneimittel-Forsch. 13 29; Merck Index (1960) 828.

ZANTHOXYLUM BARK

SYNONYMS

Prickly Ash Bark; Toothache Bark; Xanthoxylyum.

DEFINITION

Zanthoxylum Bark consists of the bark of either *Zanthoxylum clava-herculis* L. known as Southern Prickly Ash or *Zanthoxylum americanum* Mill. (Fam. Rutaceae) known as Northern Prickly Ash. The former grows extensively in the Southern United States and the latter in the North Eastern parts of the U.S.A. Zanthoxylum Bark contains alkaloids. Chelerythrine and magnoflorine both quaternary 1-benzyltetrahydroisoquinoline alkaloids predominate in *Z. clava-herculis*, while nitidine and lauriflorine, benzophenanthridine alkaloids, predominate in *Z. americanum*. Coumarins are present in *Z. americanum* but absent from *Z. clava-herculis*.

B.P.C. (1934), p. 1117. Martindale 27th Edn., p. 1830.

DESCRIPTION

Macroscopical: Northern prickly ash bark occurs in transversely curved pieces or single quills 2-18 cm long, 2-4 mm thick, externally brown with grey patches of lichen bearing numerous apothecia and white lenticels with occasional emergencies ending in spines. The fracture is short, yellow-white, inner surface exhibits fine longitudinal striations and numerous glistening crystals. Southern prickly ash is frequently marked with prominent limpet-shaped conical corky emergencies. Odour, both barks have a slight odour; taste pungent and bitter.

Microscopical: Powder light-grey brown, starch grains numerous nearly spheroidal 2-10 μm in diameter, free and occurring in the parenchyma; calcium oxalate chiefly in monoclinic prisms from 10-45 μm in length occurring in crystal fibres and in parenchyma cells of the primary cortex; oil secretion cavities; cork cells thickened and lignified; lignified bark fibres thick-walled with occasional swelling.

Total Ash: Not more than 6%.

Acid Insoluble Ash: Not more than 1.5%.

Foreign Organic Matter: Not more than 2%.

THERAPEUTICS

Action: Circulatory stimulant. Diaphoretic. Antirheumatic. Carminative. Sialogogue.

Indications: Cramps. Intermittent claudication. Raynaud's syndrome. Chronic rheumatic conditions.

Specific Indications: Peripheral circulatory insufficiency, associated with rheumatic symptoms.

Combinations used: May be combined with Myrica, Zingiber in deficient circulation; with Guaiacum, Menyanthes and Capsicum in 'rheumatism'.

Preparations and Dosage: (thrice daily)

Dried bark. Dose 1-3 g or by decoction. Liquid Extract 1:1 in 45% alcohol.

Dose 1-3 ml. Tincture 1:5 in 45% alcohol. Dose 2-5 ml.

ZANTHOXYLUM BERRIES

SYNONYMS

Xanthoxylum Fruit; Prickly Ash Berries.

DEFINITION

Zanthoxylum Berries are the dried, full grown fruit of *Zanthoxylum americanum* Miller and *Zanthoxylum clava-herculis* L. (Fam. Rutaceae). Zanthoxylum berries contain a resin and a volatile oil.

DESCRIPTION

Macroscopical: Fruit consists of 2-3 follicles each of which is 5-6 mm long, fleshy, grey-brown to black in colour and dehiscent along the ventral suture, containing 1 or 2 seeds; seeds of *Z. americanum* dark brown finely rugose, elliptical, 2-4 mm; seeds of *Z. clava-herculis* black, glossy, wrinkled, 2.5-3.5 mm. Odour aromatic; taste pungent and bitter.

Microscopical: Powder dark brown, numerous fragments of pericarp showing large oil cavities and vascular tissue surrounded by parenchyma cells containing irregular masses of hesperidin; fragments of inner layer of pericarp composed of narrow irregular elongated cells with lignified walls and simple pores; polygonal cells of seed coat with brown walls, numerous globules of volatile oil.

Total Ash: Not more than 8%.

Acid Insoluble Ash: Not more than 2%.

Paper Chromatography: Moriba, N. and Shimizu, M. (1966) Yakugaku Zasshi, 86, (8), 732.

THERAPEUTICS

Action and Indications: Similar to the bark, but therapeutically more active in circulatory disorders.

Preparation and Dosage: Dried berries. Dose 0.5-1.5 g. Liquid Extract 1:1 in 45% alcohol. Dose 0.5-1.5 ml.

ZEA

SYNONYMS

Corn Silk; Stigmata Maydis; Maidis Stigmata.

DEFINITION

Zea consists of the fresh or dried stigmas and styles obtained from *Zea mays* L. (Fam. Gramineae) an annual plant indigenous to America. The styles and stigmas should be collected from the unripe corn. Zea contains a volatile alkaloid, resins, maizeric acid, fixed oil and sugar.

B.P.C. (1934), p. 372. Martindale 26th Edn., p. 659.

DESCRIPTION

Macroscopical: A loose tangled mass of slender yellowish filamentous styles, from 5-20 cm long, exhibiting slender bifid stigmas 0.5-3.0 mm long. Odour slight; taste insipid.

Microscopical: A yellow powder, styles consist of parenchyma with two vascular bundles composed of narrow annular or spiral tracheids, epidermal cells rectangular, often extended into multicellular hairs 0.2-0.8 mm in length, the basal portion consisting of two to five united cells, the upper portion usually unicellular. Purple-red parenchyma cells contain a red cell sap.

Total Ash: Not more than 10%.

Acid Insoluble Ash: Not more than 2%.

Water Soluble Extractive: Not less than 10%.

THERAPEUTICS

Action: Diuretic. Antilithic.

Indications: Cystitis. Urethritis. Nocturnal enuresis. Prostatitis.

Specific Indications: Acute or chronic inflammation of the urinary system.

Combinations used: Combines well with Agropyron and Arctostaphylos in cystitis; with Agrimonia and Equisetum in enuresis; with Aphanes and Eupatorium Purpureum in phosphatic or uric acid gravel.

Preparations and Dosage: (thrice daily)

Dried styles and stigmas. Dose 4-8 g or by infusion. Liquid Extract B.P.C. (1923). Dose 4-8 ml. Tincture 1:5 in 25% alcohol. Dose 5-15 ml. Syrup B.P.C. (1923). Dose 8-15 ml.

ZINGIBER

SYNONYMS

Ginger; Jamaica Ginger.

DEFINITION

Zingiber is the dried scraped rhizome of *Zingiber officinale* Roscoe (Fam. Zingiberaceae), known as unbleached Jamaica ginger. Zingiber is indigenous to Asia, and cultivated extensively in the West Indies, Africa and India. It contains 1-2% of volatile oil which contains camphene, phellandrene, zingiberene, zingiberol, eucalyptol, citral, borneol, linalool, methylheptenone and nonyl alcohol, together with esters of acetic and caprylic acid, a yellow oil gingerol which is a mixture of phenols and to which the drug owes its odour, a resin and shogaol.

B.P.C. (1973), p. 211. Martindale 27th Edn., p. 1018.

DESCRIPTION

Macroscopical: Rhizomes occur as laterally flattened branched pieces or 'hands' 5-15 cm long, 1-5 cm wide and 1 cm thick; branches arise from upper surface and terminate in a stem scar; buff to light brown externally, longitudinally striated and somewhat fibrous. Fracture short and fibrous, transverse surface exhibits numerous yellow oil cells and scattered vascular bundles and an endodermis separating the narrow cortex from the wide stele. Odour agreeable and aromatic; taste strongly pungent.

Microscopical: Yellow-cream powder consisting of large oval cells sometimes with wrinkled walls and associated with collapsed cells; contains numerous single ovate starch grains up to 40 μm long and 25 μm wide with faint transverse striations and a hilum in a slight terminal beak; fragments of parenchyma with oleo-resin; un lignified reticulate or sometimes spiral vessels, accompanied by un lignified fibres with transverse septa and dentate inner walls. Cork and calcium oxalate absent.

Jackson & Snowden, p. 154.

Total Ash: Not more than 6%.

Water Soluble Extractive: Not less than 10%.

Water Soluble Ash: Not less than 1.7%.

Thin-Layer Chromatography: Attawag, J. A., Barebas, L. J. and Wolford, R. W. (1965) Anal. Chem., 37, 1289.

THERAPEUTICS

Action: Carminative. Diaphoretic. Spasmolytic.

Indications: Colic. Flatulent dyspepsia.

Specific Indication: Flatulent intestinal colic.

Combinations used: Combines well with Gentiana and Rheum palmatum.

Preparations and Dosage: (thrice daily)

Dried rhizome. Dose 0.25-1 g or by infusion or decoction. Weak Tincture B.P. (1973). Dose 1.5-3 ml. Strong Tincture B.P. (1973). Dose 0.25-0.5 ml.

INDEX TO THERAPEUTIC INDICATIONS

Remedies specifically indicated are in italics

- Abortion, threatened – *Chamaelirium*, *Viburnum Opulus*, *Viburnum Prunifolium*
Abrasions – *Commiphora Resin*
Abscesses – *Althea leaf*, *Linum*, *Echinacea*, *Teucrium Scorodonia*, *Ulmus*
Acne – *Phytolacca*
Addison's Disease – *Glycyrrhiza*
Adenitis – *Baptisia*, *Calendula*, *Galium*, *Phytolacca*, *Stillingia*
Allergic symptoms – *Ephedra*
Alopecia neurotica – *Arnica*
Amenorrhoea (functional) – *Artemisia Abrotanum*, *Artemisia Vulgaris*, *Calendula*, *Caulophyllum*, *Chamaelirium*, *Gossypium*, *Leonurus*, *Levisticum*, *Mentha Pulegium*, *Millefolium*, *Petroselinum*, *Ruta*, *Senecio Aureus*
Amoebiasis – *Euphorbia*
Anal fissure – *Polygonum*
Angina pectoris – *Crataegus*, *Leonurus*
Ankylosing spondylitis – *Salix*
Anorexia – *Acorus*, *Aletris*, *Artemisia Absinthium*, *Artemisia Vulgaris*, *Carum*, *Centaurium*, *Chelone*, *Cinchona*, *Cinnamomum*, *Cnicus*, *Cola*, *Elettaria*, *Foeniculum*, *Gentiana*, *Hydrastis*, *Jateorhiza*, *Levisticum*, *Picrasma*, *Populus*, *Swertia*, *Teucrium Chamaedrys*, *Trigonella*
Anorexia nervosa – *Angelica Root*, *Centaurium*, *Chamaemelum*, *Lappa Root*, *Marsdenia*, *Picrasma*
Anxiety states – *Betonica*, *Cypripedium*, *Hyssopus*, *Primula Veris*, *Pulsatilla*, *Scutellaria*, *Tilia*, *Turnera*
Appendicitis, 'grumbling' – *Agrimonia*
Apthous ulcer – See *Ulcer*, *apthous*
Arteriosclerosis – *Tilia*, *Crataegus*, *Viscum*
Arrhythmia, cardiac – *Convallaria*
Arthritis, rheumatoid – *Apium*, *Cimicifuga*, *Dioscorea*, *Fucus*, *Gaultheria*, *Guaiacum*, *Harpagophytum*, *Jacobaea*, *Menyanthes*, *Piper Methysticum*, *Populus*, *Salix*, *Smilax*, *Symphytum Leaf*, *Teucrium Chamaedrys*
Asthma, bronchitic – *Ammoniacum*, *Angelica Root*, *Allium*, *Atropa*, *Datura*, *Drosera*, *Ephedra*, *Euphorbia*, *Grindelia*, *Lobaria*, *Lobelia*, *Passiflora*, *Pilosella*, *Pulsatilla*, *Sanguinaria*, *Senega*, *Symplocarpus*, *Thymus Vulgaris*, *Urginea*, *Viburnum Prunifolium*
Asthma, cardiac – *Convallaria*
Athlete's Foot – *Symphytum Leaf*
Avitaminosis A, C, E, K – *Medicago*
Avitaminosis C – *Rosa Canina*
Blepharitis – *Foeniculum*
Bronchitis – *Adiantum*, *Allium*, *Ammoniacum*, *Angelica Leaf*, *Angelica Root*, *Asafoetida*, *Bryonia*, *Carum*, *Cephaelis*, *Chondrus*, *Drosera*, *Eupatorium Perfoliatum*, *Euphorbia*, *Gileadensis*, *Glycyrrhiza*, *Grindelia*, *Guarea*, *Hyssopus*, *Inula*, *Linum*, *Lobaria*, *Lobelia*, *Marrubium*, *Nepeta Hederacea*, *Pilosella*, *Pimpinella*, *Prunus*, *Pulmonaria*, *Quillaja*, *Sanguinaria*, *Senega*, *Stillingia*, *Symplocarpus*, *Teucrium Chamaedrys*, *Thuja*, *Thymus Serpyllum*, *Thymus Vulgaris*, *Tussilago*, *Urginea*, *Verbascum*, *Viola Tricolor*
Bronchial Catarrh – *Althaea Leaf*, *Castanea*, *Chondrus*, *Cnicus*, *Glycyrrhiza*, *Iris Florentina*, *Nepeta Hederacea*, *Petroselinum*, *Pilosella*, *Thymus Serpyllum*
Buerger's Disease – *Angelica Root*, *Crataegus*, *Dioscorea* – see also *Claudication*, *intermittent and Vascular disease*, *peripheral*

Cachexia – *Cetraria*, Chondrus, Cola, Serenoa, Swertia
 Calculus, urinary – Althaea Leaf, Agropyron, *Aphanes*, Arctostaphylos, *Collinsonia*,
Daucus, *Eryngium*, Eupatorium Purpureum, *Hydrangea*, *Parietaria*, Zea
 Capillary Fragility – *Fagopyrum*, Viola Tricolor
 Catarrh, nasopharyngeal – Adiantum, Allium, Althaea Leaf, Althaea Root, *Baptisia*,
Cetraria, Commiphora Resin, Echinacea, Eupatorium Perfoliatum, Euphorbia,
 Euphrasia, Grindelia, Hydrastis, Hyssopus, Iris Florentina, *Matricaria*, *Phytolacca*,
 Polygonum, *Pulmonaria*, Salix, Teucrium Chamaedrys, Teucrium Scorodonia,
Uliginosum, Verbascum, Viola, *Virgaurea*
 Chilblains, unbroken – Arnica, *Capsicum*, Krameria
 Cholecystalgia – Verbena
 Cholecystitis – Berberis, *Berberis Aquifolium*, Chelone, Chionanthus, Dioscorea,
Euonymus, Swertia, *Taraxacum*, Veronicastrum
 Chorea – Cimicifuga, Scutellaria, Viscum
 Claudication, intermittent – Zanthoxylum Bark – see also Buerger's Disease and Vascular
 disease, peripheral
 Colic, gall bladder – Atropa
 Colic, intestinal – Acorus, Aletris, *Alpinia*, Anethum, *Asafoetida*, Atropa, Capsicum,
Carum, Chelone, Cinnamomum, Cinnamomum Cassia, Cnicus, Dioscorea, Elettaria,
 Foeniculum, Glycyrrhiza, Juniperus, Lavandula, Levisticum, Mentha Piperita, Mentha
 Pulegium, *Nepeta Cataria*, *Petroselinum*, Pimpinella, Thymus Serpyllum, Valeriana,
Zingiber
 Colic, renal – Atropa, Eryngium
 Colitis, mucous – *Plantago Ovata*, *Plantago Psyllium*, Tsuga
 Colitis – Agrimonia, Bidens, Catechu Black, Geum, Hamamelis Bark, Hamamelis Leaf,
 Humulus, Hydrastis, Matricaria, Mitchella, Myrica, Piper Angustifolium, Polygonum,
 Potentilla, Scolopendrium, Symphytum
 Colitis, ulcerative – Sanguisorba, Ulmus
 Colon, irritable – *Matricaria*, Ulmus
 Common Cold – Allium, Cinnamomum, Cinnamomum Cassia, Commiphora Resin,
 Gileadensis, Hyssopus, Mentha Piperita, Mentha Pulegium, *Millefolium*, Myrica, *Nepeta*
Cataria, Populus, *Sambucus*, Teucrium Scorodonia, Tilia, Verbascum
 Conjunctivitis – Calendula, Euphrasia, Foeniculum, Fumaria, Hydrastis, Rubus
 Constipation – Berberis, *Cassia Fruit*, *Cassia Leaf*, Euonymus, Frangula, Iris, *Juglans*,
Plantago Ovata, *Plantago Psyllium*, Podophyllum, *Rhamnus*, Rumex Crispus,
Taraxacum, Turnera, Veronicastrum
 Contusions – Arnica, Commiphora Resin, Symphytum Leaf
 Convalescence, supplement – Chondrus, Medicago, Swertia, *Trigonella*, Ulmus
 Cough, irritable – Inula, *Lactuca*, *Lobaria*, Pimpinella, Prunus
 Cramp – Cinchona, Dioscorea, Valeriana, *Viburnum Opulus*, Zanthoxylum Bark,
 Zanthoxylum Berries
 Croup – Asafoetida, *Cephaelis*, Sanguinaria, *Stillingia*
 Cyst, sebaceous – Calendula
 Cystitis – *Agathosma*, Agrimonia, Agropyron, Althaea Leaf, Althaea Root, Apium,
 Arctostaphylos, Calluna, Capsella, Chondrus, Daucus, Equisetum, *Eryngium*,
 Eupatorium Purpureum, Filipendula, Grindelia, *Hydrangea*, Juniperus, Lappa Root,
 Levisticum, *Nepeta Hederacea*, *Parietaria*, *Petroselinum*, Peumus, Piper Angustifolium,
Piper Methysticum, Plantago Major, Plantago Ovata, Plantago Psyllium, Polygonum,
 Populus, Serenoa, Tsuga, Viola Tricolor, *Virgaurea*, Zea
 Deafness, catarrhal – Hydrastis, Sambucus
 Debility, general – Cinchona, Medicago, *Trigonella*
 Depression, mental – Avena, Cola, Cyripedium, Ilex, Lavandula, Panax, Rosmarinus,
 Turnera, Valeriana, Verbena
 Dermatitis – Chondrus
 Dermatitis, poison-ivy – Grindelia, Toxicodendron
 Diabetes Mellitus – Galega, Rhus, Syzygium, Urtica

Diarrhoea, acute – *Alchemilla*, *Capsella*, *Carum*, *Castanea*, *Cinnamomum* *Cassia*, *Geum*, *Krameria*, *Myrica*, *Quercus*, *Sanguisorba*, *Teucrium* *Chamaedrys*
 Diarrhoea, chronic – *Catechu* *Black*, *Cola*, *Geranium* *Herb*, *Krameria*, *Matricaria*, *Millefolium*, *Myristica*, *Nepeta* *Hederacea*, *Nymphaea*, *Piper* *Angustifolium*, *Plantago* *Ovata*, *Plantago* *Psyllium*, *Polygonum*, *Populus*, *Potentilla*, *Pulmonaria*, *Quercus*, *Rosa* *Canina*, *Rubus*, *Syzygium*, *Tsuga*
 Diarrhoea, infantile – *Agrimonia*, *Alchemilla*, *Cinnamomum*, *Filipendula*, *Geranium*, *Iris* *Florentina*, *Matricaria*, *Thymus* *Vulgaris*
 Dipsomania – *Cinchona*
 Diverticulitis – *Dioscorea*, *Matricaria*
 Duodenal ulcer – *Althaea* *Root*, *Calendula*, *Geranium*, *Geranium* *Herb*, *Glycyrrhiza*, *Symphytum* *Leaf*, *Ulmus*
 Duodenitis – *Chionanthus*
 Dysentery – *Alchemilla*, *Catechu* *Black*, *Cola*, *Geranium*, *Geranium* *Herb*, *Liriosma*, *Myristica*, *Plantago* *Ovato*, *Plantago* *Psyllium*, *Polygonum*
 Dysentery, amoebic – *Cephaelis*
 Dysmenorrhoea – *Artemisia* *Vulgaris*, *Carum*, *Caulophyllum*, *Chamaelirium*, *Chamaemelum*, *Calendula*, *Cimicifuga*, *Dioscorea*, *Gossypium*, *Hydrastis*, *Lactuca*, *Levisticum*, *Mentha* *Piperita*, *Mitchella*, *Petroselinum*, *Piscidia*, *Pulsatilla*, *Thymus* *Serpyllum*, *Valeriana*, *Viburnum* *Prunifolium*
 Dyspepsia, atonic – *Artemisia* *Absinthium*, *Capsicum*, *Centaureum*, *Cetraria*, *Chondrus*, *Cinchona*, *Cnicus*, *Filipendula*, *Gentiana*, *Hydrastis*, *Jateorhiza*, *Juglans*, *Picrasma*, *Populus*, *Swertia*, *Taraxacum*, *Teucrium* *Chamaedrys*, *Trigonella*
 Dyspepsia, flatulent – *Acorus*, *Alpinia*, *Anethum*, *Angelica* *Leaf*, *Angelica* *Root*, *Carum*, *Cinnamomum*, *Cinnamomum* *Cassia*, *Elettaria*, *Foeniculum*, *Jateorhiza*, *Lavandula*, *Levisticum*, *Matricaria*, *Melissa*, *Mentha* *Piperita*, *Mentha* *Pulegium*, *Myristica*, *Petroselinum*, *Salvia*, *Teucrium* *Scorodonia*, *Thymus* *Serpyllum*, *Thymus* *Vulgaris*, *Virgaurea*, *Zingiber*
 Dyspepsia, nervous – *Aletris*, *Artemisia* *Vulgaris*, *Ballota*, *Chamaemelum*, *Lavandula*, *Marsdenia*, *Matricaria*, *Melissa*, *Myristica*, *Nepeta* *Cataria*, *Prunus*, *Rosmarinus*, *Turnera*
 Dysuria – *Agathosma*, *Arctostaphylos*, *Eupatorium* *Purpureum*, *Galium*, *Petroselinum*, *Viola* *Tricolor*
 Ear-ache – *Pulsatilla*
 Eczema – *Berberis* *Aquifolium*, *Calendula*, *Fumaria*, *Hydrastis*, *Iris*, *Juglans*, *Lappa* *Root*, *Rumex* *Crispus*, *Sassafras*, *Scrophularia*, *Stellaria*, *Trifolium*, *Urtica*, *Viola* *Tricolor*
 Enteritis – *Althaea* *Root*, *Cnicus*, *Matricaria*
 Enuresis – *Ephedra*, *Equisetum*, *Rhus*, *Thuja*, *Thymus* *Vulgaris*, *Viburnum* *Opulus*, *Vinca* *Major*, *Zea*
 Epididymitis – *Pulsatilla*
 Epilepsy, Grand Mal – *Passiflora*, *Scutellaria*, *Verbena*
 Epilepsy, Petit Mal – *Hyssopus*
 Epistaxis – *Calendula*, *Urtica*
 Febrile conditions – *Baptisia*, *Geum*, *Millefolium*, *Teucrium* *Scorodonia*, *Tilia*, *Verbena*
 Fibrositis, generalised – *Castanea*, *Harpagophytum*
 Flatulence – *Cinnamomum* *Cassia*, *Jateorhiza*, *Mentha* *Piperita*
 Formication – *Mentha* *Pulegium*
 Fractures – *Pilosella*, *Symphytum*
 Furunculosis – *Althaea* *Leaf*, *Baptisia*, *Commiphora* *Resin*, *Echinacea*, *Linum*, *Nymphaea*, *Pulsatilla*, *Teucrium* *Scorodonia*, *Trigonella*, *Ulmus*
 Galactorrhoea – *Salvia*
 Gall-stones – *Berberis*, *Chelidonium*, *Chelone*, *Euonymus*, *Peumus*, *Swertia*, *Taraxacum*
 Gastric ulcer – *Acorus*, *Althaea* *Root*, *Calendula*, *Glycyrrhiza*, *Symphytum*, *Symphytum* *Leaf*, *Ulmus*
 Gastritis – *Acorus*, *Althaea* *Root*, *Berberis* *Aquifolium*, *Cetraria*, *Chondrus*, *Cinnamomum*, *Drosera*, *Glycyrrhiza*, *Hydrastis*, *Nepeta* *Hederacea*, *Rosa*, *Thymus* *Vulgaris*, *Trigonella*, *Ulmus*

Gastroenteritis – Alchemilla, Ulmus
 Gastro-intestinal atony – Swertia
 Gingivitis – Baptisia, Catechu Black, *Commiphora Resin*, Krameria, Salvia, Tsuga
 Glossitis – *Salvia*
 Glycosuria, hepatic – *Chionanthus*, Syzygium
 Goitre, lymphadenoid – Fucus
 Goitre, Grave's Disease – Lycopus
 Gout – Apium, Calluna, Daucus, Eupatorium Purpureum, Gileadensis, Guaiacum, Harpagophytum, Lappa Root, Mentha Pulegium, Salix, Sassafras, Teucrium Chamaedrys, Trigonella
 Haematemesis – Capsella, Geranium, Geranium Herb, Hamamelis Leaf, Symphytum
 Haematuria – *Bidens*, Equisetum, Eryngium, Plantago Major, Trillium
 Haemoptysis – Hamamelis Leaf, Lycopus, *Pilosella*, Trillium
 Haemorrhage, passive – Alchemilla
 Haemorrhage, postpartum – Hydrastis
 Haemorrhoids – Calendula, Geranium, Geranium Herb, *Hamamelis Bark*, *Hamamelis Leaf*, Juglans, *Krameria*, Matricaria, Nepeta Cataria, Nepeta Hederacea, Piper Angustifolium, Plantago Major, Potentilla, Pulmonaria, Quercus, *Ranunculus*, Sanguisorba, Vinca Major
 Hay fever – Ephedra
 Headache, neuralgic – *Betonica*, *Humulus*, Hypericum, *Ilex*, Lavandula, Nepeta Cataria, Passiflora, Piscidia, Pulsatilla, Rosmarinus
 Heart failure – *Convallaria*, *Crataegus*, *Leonurus*, *Scoparium*
 Heartburn, hyperchlorhydric – *Chondrus*, Filipendula
 Hernia – *Pilosella*, Symphytum
 Hyperchlorhydria – Cinchona
 Hypertension, arterial – *Crataegus*, *Fagopyrum*, *Millefolium*, *Tilia*, *Viscum*
 Hyperhidrosis – Atropa, Salvia, Senecio Aureus
 Hypochlorhydria – Jateorhiza
 Hypochondriasis – Valeriana
 Hypotension, arterial – *Panax*, *Scoparium*
 Hysteria – Asafoetida, *Betonica*, Cyripedium, Hyssopus, Passiflora, Primula Veris, Pulsatilla, Rosmarinus, Scutellaria, *Tilia*, *Valeriana*, Verbena, Viscum
 Impotence – see Sexual Inadequacy
 Incontinence, urinary – Agrimonia, *Equisetum*, *Rhus*
 Infertility – Avena, *Panax*, Serenoa
 Influenza – Allium, Asclepias, Cinchona, Cinnamomum, *Eupatorium Perfoliatum*, *Millefolium*, Salix, Sambucus, Verbascum, Virgaurea
 Insomnia – *Cypripedium*, *Humulus*, Lactuca, Matricaria, Nepeta Cataria, *Panax*, *Passiflora*, *Piscidia*, *Primula Veris*, *Pulsatilla*
 Irritable Bowel Syndrome – *Plantago Ovata*, *Plantago Psyllium*
 Jaundice – Centaurium, *Chionanthus*, *Berberis*, Euonymus, *Rumex Crispus*, Taraxacum, Verbena, Veronicastrum
 Labour pains, premature – Ballota, Caulophyllum, *Leonurus*, Viburnum Prunifolium
 Laryngeal spasm – *Cephaelis*, Euphorbia
 Laryngismus stridulus – see Croup
 Laryngitis – Baptisia, Capsicum, Carum, *Gileadensis*, Phytolacca, Pulmonaria, *Salvia*, Sanguinaria, Stillingia, Thymus Serpyllum, Thymus Vulgaris, Tussilago, Uliginosum
 Leishmaniasis – *Berberis*
 Leprosy, adjunct – Smilax
 Leucorrhoea – Alchemilla, Baptisia, *Berberis Aquifolium*, Catechu Black, Chamaelirium, Geranium, Geranium Herb, Myrica, *Nymphaea*, Piper Angustifolium, Polygonum, Quercus, Senecio Aureus, Trillium, *Tsuga*, Vinca Major
 Lithuria – Agropyron, Arctostaphylos, Calluna, Collinsonia, *Daucus*, Eryngium, Eupatorium Purpureum, *Hydrangea*, Levisticum, *Parietaria*, Zea

Liver congested – *Chionanthus*, *Euonymus*, *Hydrastis*, *Iris*, *Juglans*, *Peumus*, *Veronicastrum*
 Lumbago – *Aconitum*, *Bryonia*, *Capsicum*, *Castanea*, *Harpagophytum*
 Lymphadenopathy – *Baptisia*, *Calendula*, *Galium*, *Phytolacca*, *Stillingia*, *Trigonella*
 Malaria – *Berberis*, *Cinchona*, *Swertia*
 Mammary Abscess – *Phytolacca*, *Symphytum Leaf*, *Ulmus*
 Mastitis – *Matricaria*, *Phytolacca*, *Symphytum Leaf*, *Thymus Serpyllum*
 Melaena – *Geranium*, *Geranium Herb*
 Menopausal Neurosis – *Avena*, *Hypericum*, *Senecio Aureus*
 Menorrhagia – *Alchemilla*, *Capsella*, *Geranium*, *Geranium Herb*, *Hydrastis*, *Krameria*, *Scoparium*, *Vinca Major*, *Trillium*
 Metrorrhagia – *Bidens*, *Capsella*, *Geranium*, *Geranium Herb*, *Sanguisorba*, *Trillium*, *Vinca Major*, *Viburnum Opulus*
 Migraine – *Cola*, *Gelsemium*, *Lavandula*, *Piscidia*, *Rosmarinus*, *Valeriana*
 Miscarriage, threatened – *Aletris*, *Caulophyllum*
 Mumps – *Phytolacca*
 Myalgia – *Bryonia*, *Capsicum*, *Cimicifuga*, *Cinchona*, *Dioscorea*, *Filipendula*, *Gaultheria*, *Gileadensis*, *Harpagophytum*, *Juniperus*, *Lactuca*, *Lavandula*, *Menyanthes*, *Petroselinum*, *Pulsatilla*, *Trigonella*
 Myasthenia gravis – *Ephedra*
 Myositis – *Lobelia*
 Myxoedema – *Fucus*
 Nausea – *Alpinia*, *Ballota*, *Chondrus*, *Cinnamomum*, *Cinnamomum Cassia*, *Iris*, *Myristica*, *Petroselinum*
 Narcolepsy – *Ephedra*
 Neoplasm – *Galium*, *Rumex Crispus*, *Thuja*, *Viola*, *Viscum*
 Nephritis – *Zea*
 Nervous excitability – *Primula Veris*
 Neuralgia, general – *Capsicum*, *Gelsemium*, *Humulus*, *Hypericum*, *Panax*, *Passiflora*, *Piscidia*, *Pulsatilla*
 Neuralgia, intercostal – *Gaultheria*, *Gelsemium*, *Lavandula*, *Linum*
 Neuralgia, peripheral – *Aconitum*
 Neuralgia, trigeminal – *Gelsemium*
 Neurasthenia – *Humulus*, *Panax*
 Nipples, sore – *Baptisia*
 Nymphomania – *Lactuca*
 Obesity – *Fucus*
 Oedema, cardiac – *Convallaria*
 Oedema, renal – *Levisticum*, *Parietaria*, *Pilosella*
 Oliguria – *Parietaria*, *Taraxacum*
 Orchitis – *Pulsatilla*
 Otorrhoea – *Hydrastis*
 Ovaralgia – *Dioscorea*, *Pulsatilla*, *Viburnum Opulus*
 Partus praeparator – *Mitchella*, *Rubus*
 Pediculosis – *Picrasma*, *Pimpinella*, *Sassafras*
 Pertussis – see Whooping Cough
 Petechiae – *Fagopyrum*
 Pharyngitis – *Adiantum*, *Althaea Root*, *Baptisia*, *Castanea*, *Catechu Black*, *Cinchona*, *Commiphora Resin*, *Foeniculum*, *Krameria*, *Nymphaea*, *Polygonum*, *Quercus*, *Salvia*, *Sanguinaria*, *Senega*, *Tsuga*
 Phthisis – *Inula*
 Pleurisy – *Angelica Leaf*, *Asclepias*, *Bryonia*, *Linum*, *Verbascum*
 Pleurodynia – *Aconitum*, *Bryonia*, *Harpagophytum*
 Polydipsia – *Rosa*
 Polypus, nasal – *Sanguinaria*
 Polyuria – *Eryngium*, *Piper Methysticum*, *Viola Tricolor*

Post-vaccinal reaction – Thuja
 Pneumonitis – Asclepias, Verbascum
 Priapism – Humulus, Lactuca
 Proctitis – Calendula
 Prolapsus uteri – Tsuga
 Prostatic Enlargement – Agropyron, *Equisetum*, Eryngium, Hydrangea, *Serenoa*
 Prostatitis – Agathosma, Agropyron, *Equisetum*, *Eryngium*, Eupatorium Purpureum, Hydrangea, Zea
 Pruritus ani – Hydrastis, *Scrophularia*, *Stellaria*, Tanacetum
 Pruritus vulvae – Alchemilla
 Psoriasis – *Berberis Aquifolium*, Galium, *Lappa Root*, Rumex, *Scrophularia*, *Smilax*, *Stellaria*, Thuja, *Trifolium*
 Ptyalism – Atropa
 Purpura, hypoprothrombinaemic – Medicago
 Pyelitis – Arctostaphylos, Parietaria
 Pyorrhoea – Echinacea
 Pyuria – Agathosma
 Quinsy – Uliginosum – *see also* Tonsillitis
 Radiation damage – Fagopyrum
 Raynaud's Syndrome – *Zanthoxylum Bark*
 Retinal haemorrhage – Fagopyrum
 Rheumatic nodules – Lobelia
 Rheumatic pain – *Aconitum*, *Bryonia*, Myristica
 Rheumatism – Angelica Root, *Apium*, Bryonia, Calluna, Castanea, Caulophyllum, Centella, *Cimicifuga*, Dioscorea, Eupatorium Purpureum, Filipendula, Fucus, Gaultheria, *Guaicum*, *Harpagophytum*, Ilex, *Jacobaea*, Juniperus, *Lappa Root*, Lavandula, *Menyanthes*, Peumus, Phytolacca, Piper Methysticum, Populus, Sassafras, *Smilax*, *Stellaria*, Symphytum Leaf, Taraxacum, Teucrium Scorodonia, Thuja, Thymus Serpyllum, Valeriana, *Zanthoxylum Bark*
 Scabies – Phytolacca, Pimpinella, Tanacetum
 Sciatica – Aconitum, *Cimicifuga*, Gaultheria, Hypericum, Thymus Serpyllum
 Septicaemia – Baptisia, Echinacea
 Sexual Inadequacy – Liriosma, *Panax*, Turnera, *Serenoa*
 Sialorrhoea, in parkinsonism – Datura
 Sinusitis – Euphrasia, Sambucus
 Skin Disease – *Berberis Aquifolium*, *Calendula*, Centella, Euonymus, *Iris*, Juglans, Mentha Pulegium, Rumex Crispus, Sassafras, *Smilax*, *Stillingia*, Teucrium Chamaedrys, Viola Tricolor – *see also* Eczema, Dermatitis and Psoriasis
 Splenomegaly – Chionanthus, Cinchona, Scolopendrium
 Sprains – *Arnica*, Symphytum Leaf
 Stomatitis – Althaea Root, Baptisia, Catechu Black, Commiphora Resin, Polygonum, Rubus, *Salvia*, Tsuga
 Sycosis – Phytolacca
 Tachycardia – Lycopus, Passiflora, *Scoparium*, Viscum
 Thrombosis, cerebral – *Millefolium*
 Thrombosis, coronary – Crataegus
 Thyrotoxicosis – Lycopus
 Tinea – Phytolacca
 Tinnitus aurium – *Cimicifuga*, Hydrastis, Nepeta Hederacea
 Tonsillitis – Baptisia, Catechu Black, Commiphora Resin, Echinacea, Gileadensis, Levisticum, Myrica, Phytolacca, Potentilla, Quercus, Rubus, *Salvia*, Thymus Serpyllum, Thymus Vulgaris, Uliginosum
 Tormina – Anethum
 Travel Sickness – Matricaria
 Tracheitis – Adiantum, Castanea, *Pimpinella*, Verbascum, Prunus
 Ulcer, aphthous – Baptisia, *Commiphora Resin*, Levisticum

Ulcer, crural – **Althaea** Root, **Althaea** Leaf, **Baptisia**, **Calendula**, **Cnicus**, **Geranium**, **Geranium** Herb, **Humulus**, **Matricaria**, **Myrica**, **Stellaria**, **Symphytum**, **Symphytum** Leaf, **Teucrium** **Scorodonia**, **Trigonella**, **Trillium**, **Ulmus**

Ulcer, leprous – **Centella**

Ulcer, peptic – **Bidens**, **Filipendula**, **Geranium** Herb, **Glycyrrhiza**, **Symphytum** Leaf, **Ulmus**

Urethritis – **Agathosma**, **Agropyron**, **Althaea** Leaf, **Apium**, **Arctostaphylos**, **Equisetum**, **Eryngium**, **Eupatorium** **Purpureum**, **Hydrangea**, **Piper** **Angustifolium**, **Piper** **Methysticum**, **Serenoa**, **Zea**

Urticaria – **Ephedra**

Uterine, atony – **Caulophyllum**, **Senecio** **Aureus**

Uterine, cramp – **Cimicifuga**, **Viburnum** **Opulus**

Uterine, haemorrhage – **Capsella**, **Geum**, **Hydrastis**, **Urtica**

Uvulitis – **Salvia**

Vaginitis – **Nymphaea**

Varicose veins – **Calendula**

Vascular Disease, peripheral – **Angelica** Root, **Capsicum**, **Sanguinaria**, **Zanthoxylum** Bark, **Zanthoxylum** Berries – see also **Buerger's Disease** and **Claudication**, intermittent

Vertigo – **Betonica**

Vomiting – **Petroselinum** – see also **Nausea**

Vomiting, of pregnancy – **Ballota**, **Mentha** **Piperita**

Warts – **Chelidonium**, **Podophyllum**, **Thuja**

Whooping Cough (Pertussis) – **Allium**, **Asafoetida**, **Atropa**, **Cephaëlis**, **Cimicifuga**, **Datura**, **Grindelia**, **Lactuca**, **Marrubium**, **Pilosella**, **Pimpinella**, **Prunus**, **Symplocarpus**, **Thymus** **Serpyllum**, **Thymus** **Vulgaris**, **Trifolium**, **Tussilago**, **Urginea**, **Viola** **Tricolor**

Worms, nematode infestation – **Artemisia** **Abrotanum**, **Artemisia** **Absinthium**, **Artemisia** **Vulgaris**, **Picrasma**, **Tanacetum**

Wounds – **Calluna**, **Castanea**, **Centella**, **Commiphora** Resin, **Krameria**, **Pulmonaria**, **Symphytum**, **Thymus** **Serpyllum**, **Trigonella**

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of

BOTANICAL, COMMON NAMES AND SYNONYMS

Where the name of the species is incorporated in the title of a monograph the initial letter is capitalised.

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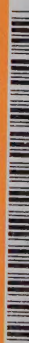
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